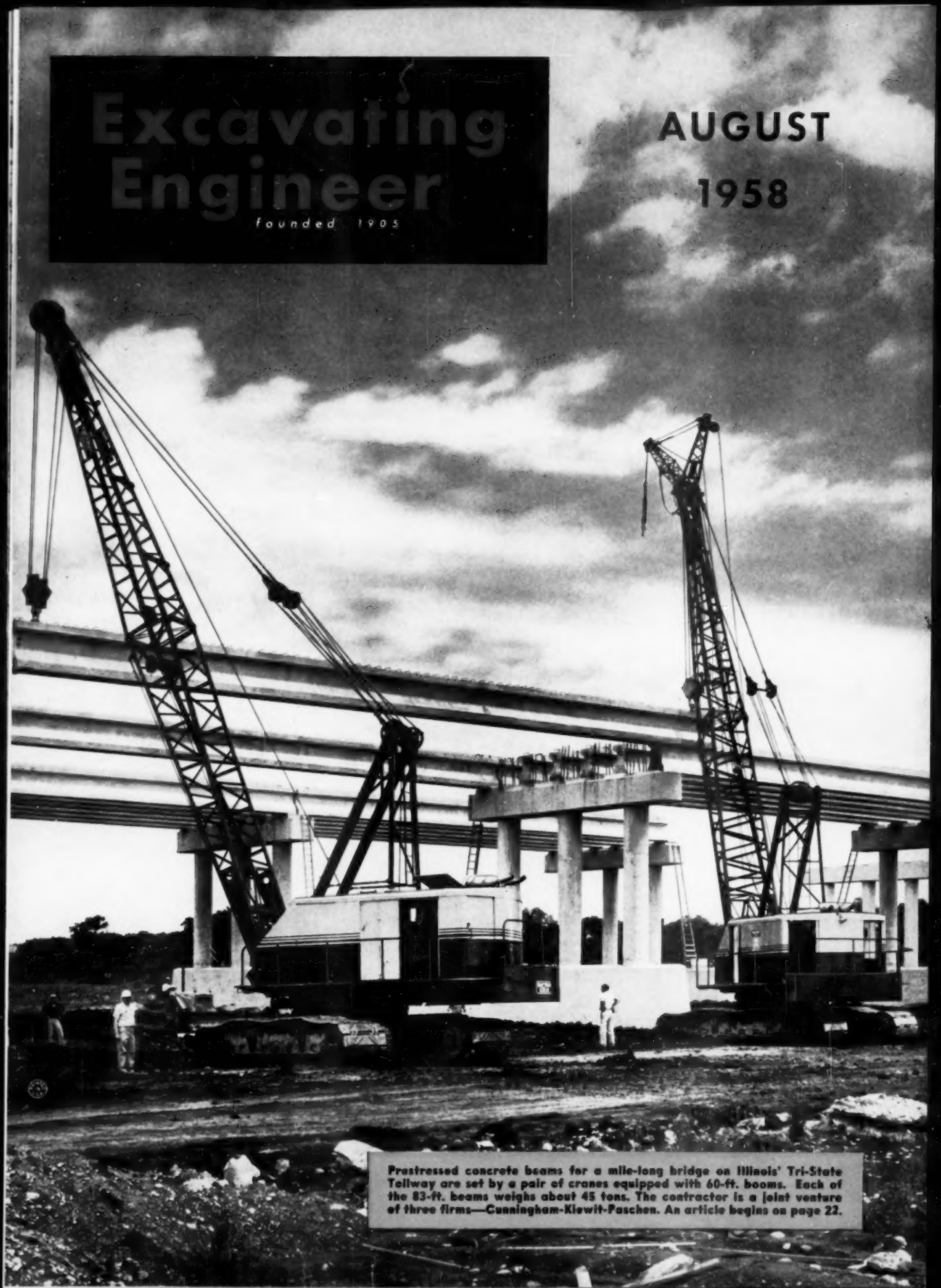
Excavating Engineer

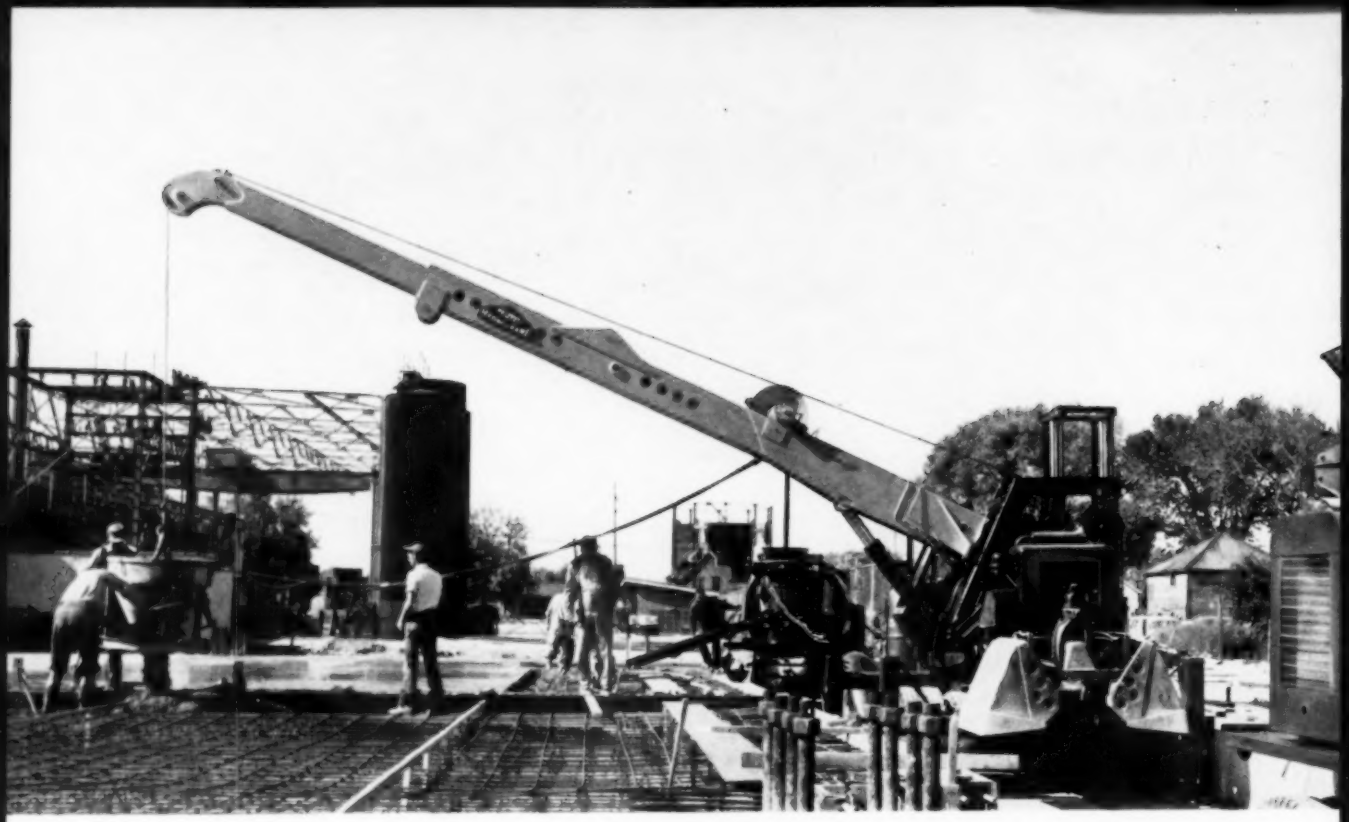
founded 1905

AUGUST

1958



Prestressed concrete beams for a mile-long bridge on Illinois' Tri-State Tollway are set by a pair of cranes equipped with 60-ft. booms. Each of the 83-ft. beams weighs about 45 tons. The contractor is a joint venture of three firms—Cunningham-Klewit-Paschen. An article begins on page 22.



This Hydrocrane uses its precision control to spot a ½-yd. bucket on a pouring job at Fond du Lac, Wisconsin.

To give you a money-makin' edge...

Hydrocrane's Inch-Splittin' Accuracy Speeds Up Pouring and Placing

You can move a concrete bucket or prestressed slab an inch as easy as you move it a foot — lift a full bucket as easy as you lift a pound. Hydrocrane's *all-hydraulic* "on-the-button" controls give you quick, accurate pours and placements—a money-makin' edge for you.

Four hydraulic outriggers set in seconds; form a stable, level work base. With this stability you can take full advantage of the Hydrocrane's lifting capacity—even on over-the-side lifts.

Your Bucyrus-Erie distributor is ready to show you the money-makin' edge in operating speed and precision control that belongs to the 12-ton H-5 . . . and 5-ton H-3 Hydrocranes.

240H58C

Other Hydrocrane money-makin' edges

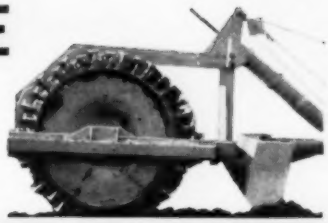
- low-cost new or used standard commercial motor truck mounting
- short tail swing for close-quarter jobs
- telescoping boom reaches in and out, over and under
- quick setups and knock-downs, open road speeds up to 50 mph

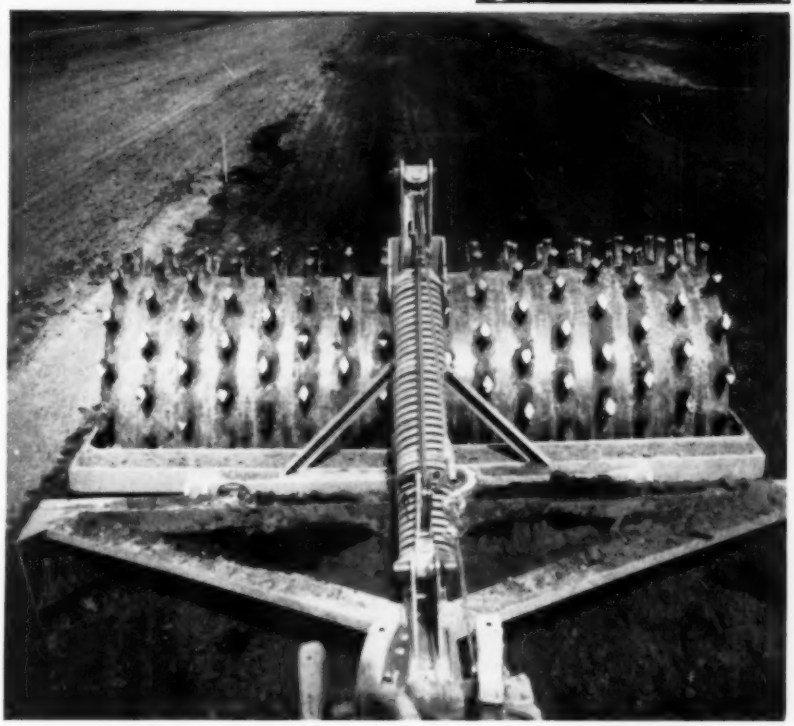
BUCYRUS ERIE HYDROCRANE

Over 50% of Hydrocranes Sold Last Year Were Repeat Orders

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

LAST YEAR HE WOULDN'T OWN ONE —THIS YEAR HE BOUGHT TWO!





The BROS Leveling Tamping Roller* is such an uncomplicated piece of equipment that last year even big grading contractors like Alley Construction Co., of Faribault, Minn. couldn't quite visualize its real value on earthfill work.

But this year, Lloyd Parker, Alley's superintendent on the grading job for nearly a million yards at Wold-Chamberlain Airport in the Twin Cities, put a BROS G2 Roller-Level Blade combination on the job —the results were so good that he purchased a second unit the *very next day!*

You can easily see why: The Leveling Roller makes subgrade rolling a productive item because it produces uniform, proper densities faster than conventional tamping rollers can. The blade puts the materials into the voids, building a smooth, level course, permitting equal compaction pressure over the full width of the drum. Because the course is smooth and compaction is fast, scrapers can haul and spread at faster speeds, earning you greater profits.

The Leveling Blade has 14" vertical adjustment which is controlled from the operator's seat by either hydraulic or cable control. The Leveling Roller is available in rolling capacities from 15,160 lbs. to 44,700 lbs. when roller drum is filled with wet sand.

*Patent Pending

Level Blade Attachments for your present BROS M2 and G2 Series Tamping Rollers are also available. M2 Blade Specifications: 112" width; 24" height; and ½" x 6" double bevel reversible high carbon steel cutting edge. G2 Blade Specifications: 141" width; 31" height; ⅝" x 8" square edge reversible high carbon steel cutting edge.

Get complete information on this new profit-making equipment from your nearest BROS Dealer or write us. World-wide sales and service.

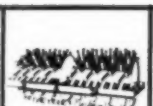
BROS

BROS *Incorporated*

ROAD MACHINERY DIVISION

1057 TENTH AVE. S.E.
MINNEAPOLIS 14, MINN.

Write today for the full report on the Ohio tests and for complete new literature describing the new BROS SP-730 pneumatic roller. It's free of cost or obligation!



SHEEPSFOOT TAMPERS

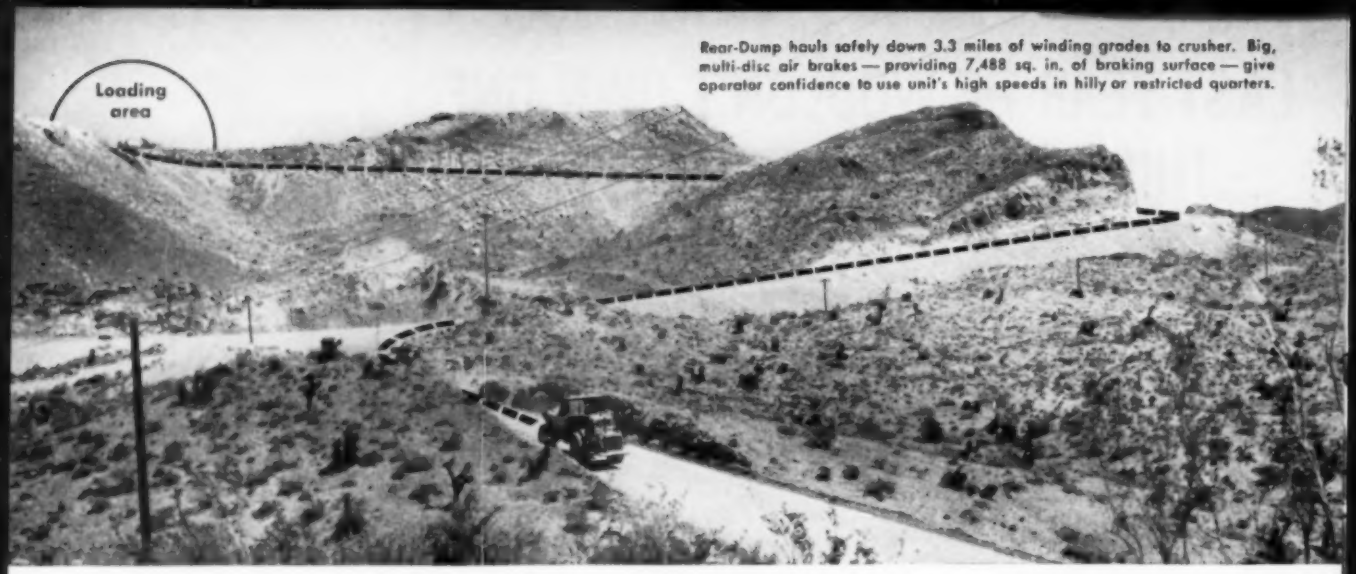
ROLL-O-PACTOR

BITUMINOUS CIRCULATOR

VIBRA-PACTOR

9-TON SELF-PROPELLED ROLLER

9 AND 13-TON ROLLERS



Rear-Dump hauls safely down 3.3 miles of winding grades to crusher. Big, multi-disc air brakes — providing 7,488 sq. in. of braking surface — give operator confidence to use unit's high speeds in hilly or restricted quarters.

On 6.6-mile cycle . . .

two 35-ton haulers move 2,352 tons limestone daily

A large California cement plant produces 5 million barrels of cement a year. To meet today's stepped-up demands, the company is mining limestone at several pits at Oro Grande — 24 hrs. a day, 5 days a week. Important tools in their hauling fleet are two LeTourneau-Westinghouse 35-ton B Tournapull® Rear-Dumps. Here's how these high-production units perform:

Haul up and down average 3 to 4% grades

35-ton B Rear-Dumps are loaded to heaped capacity by a 2½-yd. shovel. Units then haul material 3½ miles to crushing plant. On the haul, Tournapulls travel up 4% grade for 1/5 mile, and then over an average 3 to 4% down-grade for 3⅓ miles. Despite waiting time at shovel and plant hopper, company records show the two Rear-Dumps average 98 tons (2.8 loads) per hour. At this rate, units haul 784 tons per 8-hr. shift . . . or 2,352 tons daily.

"Maneuverable, easy to maintain"

Quarry Superintendent commented, "I like the 'B's' . . . they're maneuverable and easy to maintain. And on steep downhill hauls we have to have their sure, safe brakes." Added one of the operators, "The B Rear-Dump is easy to control. We do our own lube and it takes me only 5 minutes per machine."

Use rubber-tired tractor for clean-up

The company uses another LeTourneau-Westinghouse tool to speed pit operations. It is a high-speed 210 hp Tournatractor®. This rubber-tired tractor shuttles around the multiple pit operations fast — cleans up around shovels and blast area, and maintains haul roads. On blast clean-up, Tournatractor completes the job in ⅓ the time it used to take with a crawler tractor.

Cut operating costs

Any pit operation shows more production . . . more profit . . . when it has modern high-speed equipment in its fleet. Why not arrange for a demonstration of LeTourneau-Westinghouse Rear-Dump, and/or Tournatractor? Call or write for complete details. No obligation.

BRCT-1540-QMJ-1

Big B Rear-Dump empties 35-ton load of limestone into hopper. Electric hoist motor — operated by electric switch on dashboard—lifts bowl at any desired angle for slow, precision feeding.

Tournatractor cleans up around 2½-yd. electric-power shovel at California limestone pit. Rubber-tired tractor drives job-to-job fast — crosses air-drill hoses, electric cables, railroad tracks, pavement, without damage. Operator says: "Tournatractor is fast . . . beats a crawler to keep pits and haul roads clean."

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Advertisers
IN THIS ISSUE

Allis-Chalmers Mfg. Co. 14–15
American Chain & Cable Co., Inc., American Cable Div. 57
American Hoist & Derrick Co., Crosby-Laughlin Div. 49
American Steel & Wire Div., U. S. Steel Corp. 42–43
Aveling Barford, Ltd. 12
Bros, Inc. 1
Bucyrus-Erie Co. .. 2nd Cover, 9, 41, 50–51
Caterpillar Tractor Co. 6–7, 34, 35, 46–47, 58–59
Colorado Fuel & Iron Corp. 8
Columbia-Geneva Steel Div., U. S. Steel Corp. 42–43
Crosby-Laughlin Div., American Hoist & Derrick Co. 49
Drake-Williams Mount 36
Eimco Corp., The 11
Electric Steel Foundry Co. 13
Euclid Div., General Motors Corp. 38–39
For Sale (Classified) 62–63, 64
Foster, L. B. & Co. 64
General Motors Corp., Euclid Div. 38–39
Hammerblow Wire Rope Cutter Co. 48
Hayward Co., The 60
Hendrix Mfg. Co. 4
Hough Co., The Frank G. 32–33
Inorganic Chemicals Div., Monsanto Chemical Co. ... 3rd Cover
Jacob Press' Sons, Inc. 52
LeTourneau-Westinghouse Co. 2
Marion Metal Products Co. 31
Marion Power Shovel Co. 61
Monsanto Chemical Co., Inorganic Chemicals Div. ... 3rd Cover
Northwest Engineering Co. 5
Owen Bucket Co., The 45
Roebling's Sons Corp., John A. 8
Rogers Bros. Corp. 37
Sauerman Bros., Inc. 10
Tennessee Coal & Iron Div., U. S. Steel Corp. 42–43
United States Steel Corp. 42–43
United States Steel Export Co. 42–43
Williams Bucket Div., Wellman Engineering Corp 55
Wix Corp. ..... 4th Cover

Excavating Engineer

founded 1908

South Milwaukee, Wisconsin

CONTENTS

Volume 52 No. 8 **August 1958**

New England's Largest Stone Producer—by Syd Jamieson 16

New Haven (Conn.) firm relies on 2½ and 3-yd. shovels to keep production high at its three widely scattered quarries. Plants turn out total of nearly 1,200 tph of finished product.

Cranes Set 45-Ton Prestressed Beams for Tollway Bridge 22

Cunningham-Kiewit-Paschen combine builds mile-long dual bridge on Illinois' Tri-State tollway. Job includes erecting seven miles of concrete beams and constructing 106 bridge piers.

Let's Talk Tracks—by Thomas C. Kingsley 29

The greatest single cost in the upkeep of a track-type tractor goes for repair and replacement of track. A service engineer tells how these costs can be kept down in a two-part article.

News from the Field 34

Plan Mining Show 34
Show New Drill Plant 34
Blast Opens Navigation 34
Device Protects Crane Operators 36

Equipment You Ought to Know About 40

Not in the Contract 56

New Trade Literature 60

Notes from the Manufacturers 64

Copyright 1958 by Bucyrus-Erie Company. Published monthly at South Milwaukee, Wisconsin, U.S.A. Single copy price, 35 cents. Regular subscription (payable in advance) $3.50 a year; Canada and foreign, subject to publication policy, $5.00 per year. Special subscription: Upon written request on company letterhead this publication will be sent free of charge to companies, executives and supervisors engaged actively in excavating. Occupation of subscriber must be given for all subscriptions, paid or special. Right is reserved to refuse foreign subscriptions. Indexed by Engineering Index, Inc. Volumes available on microfilm.

H. A. BURKHARDT, Manager
M. B. JAEGER, Publisher
W. C. VAN DYKE, Sales Manager

W. E. WILLIAMS, Editor
D. L. FOELKER, Assistant Editor
E. W. ARNDT, Art Editor

ANITA SIEVERT, Circulation
H. LINDQUIST, Staff Photographer

Circulation of Excavating Engineer is audited by Business Publications Audit of Circulation, Inc. BPA

meeting every digging requirement...

Whatever the job...
men who know
specify
Hendrix Dragline Buckets.

HENDRIX DRAGLINE BUCKETS

"A Type for Every Digging Purpose"...
¼ to 40 Cubic Yards-Perforated or Solid

H endrix Lightweight DRAGLINE BUCKETS

HENDRIX MANUFACTURING COMPANY, Inc.
MANSFIELD, LOUISIANA

CUT THE COST AND TIME *for moving your big rigs!*

Boom and Basic Machine travel to job on separate trailers.

ONLY 4 HOURS FROM START TO WORK!

Boom is fitted to basic machine.

WHAT is it costing you to move a 2½-yd. Shovel from job to job? How much is lost in time? Some machines in this capacity range, take up to two-days and require an extra crane.

Your Northwest 80-D, 2½-yd. Shovel can be reduced in weight for road travel and be on the job in a matter of hours. Northwest 80-D's have been dismantled, put over the road 20 miles and working on the job in 8 hours. The machine pictured, owned by the Consumers Company of Milwaukee, was dismantled, loaded on trailers, erected and on the job in only 4 hours.

Moving your Northwest 80-D is a simple operation. The boom is lowered to the truck or trailer bed and unbolted from the base. Cables and Crowd Drum are part of the boom assembly. Cables are coiled back on the boom. The basic machine backs out and loads itself on another trailer. The procedure is reversed on arriving at the job and the machine goes to work. Further reduction in weight can be had including removable counterweight on your Northwest. No crane is needed. Two men with ordinary tools can do the job! It is quick, easy and a real time and money saver. Another of the many Northwest advantages for making money for you. Ask for details.

Four hours later the Northwest is fully assembled and at work.

Always Ready to **GO**

NORTHWEST ENGINEERING COMPANY
1506 Field Bldg., 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
¾ Yd. to 2½ Yd. Capacity	13-Ton to 30-Ton Capacity	¾ Yd. to 3 Yd. Capacity	¾ Yd. to 2½ Yd. Capacity	25-Ton and 35-Ton Capacity

S-80-46-1CG

ONLY CATERPILLAR GIVES YOU THE OIL

Here is what you should know about its money-saving and operating advantages

How much better is the exclusive Caterpillar oil clutch than the ordinary clutch? It can be summed up in this short statement:

When the Caterpillar oil clutch is ready for *adjustment*, the ordinary clutch is ready for *replacement*. Experience in the field proves it.

In the years since 1954, when Caterpillar introduced this remarkable advance in earthmover power trains, owners all over the country have reported thousands of hours of oil clutch operation free of adjustment or repair.

Typical of these reports is this one from Myron Omernik, land improvement contractor of Custer, Wis.: "Our D7 has operated 5,100 hours without any oil clutch repairs or adjustment."

This performance record means two clear-cut money-saving advantages:

1. Virtual elimination of down time caused by clutch failure.

2. Greatly reduced repair costs.

But in addition to its economy features, the oil clutch also provides superior operation. Here is why:

1. A hydraulic booster on the D9 and D8, operated by clutch oil pump pressure, takes the effort out of clutch operation but retains clutch "feel."

2. Clutch "fade" because of overheating is practically eliminated. The oil in which the clutch parts run is pumped directly from the crankcase. This means the clutch temperature never rises above engine temperature.

3. A clutch brake helps match clutch and transmission speeds—making shifting easier.

Here, in brief, is how the oil clutch works:

Three metallic-faced plates are separated by oil films at all times except for the last revolution or two as the clutch is engaged. Oil enters the inner diameters of the clutch plates and circulates between them by means of grooves in the clutch facings, carrying away heat and reducing wear. All clutch parts are constantly running in oil.

The exclusive Caterpillar oil clutch is not an "extra"—it is *standard equipment* on the D9, D8, D7 and D6 Tractors, all Traxcavators, on the No. 12 Motor Grader and on the MD6 and MD7 Pipelayers. Yet it is an "extra" in *value* that is unmatched in the industry.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

IMPORTANT OIL CLUTCH FEATURES

Independent oil pump assures positive lubrication and cooling for clutch plates, bearings and other vital moving parts.

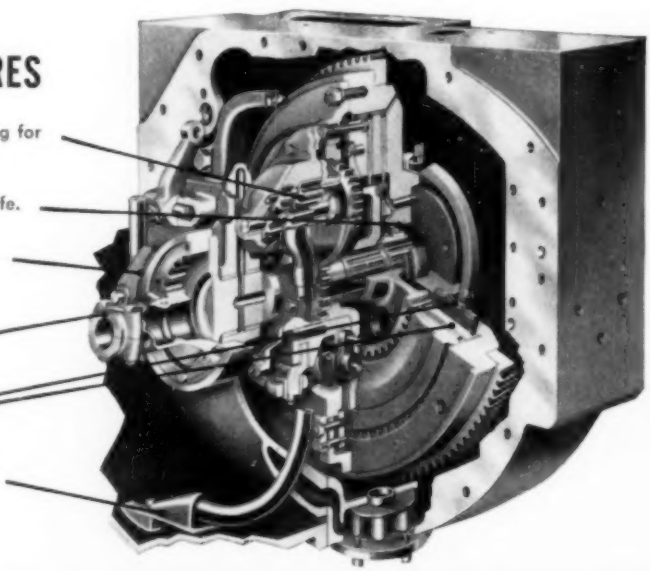
Heavy-duty bearings have extra capacity for long service life.

Clutch brake helps match clutch and transmission speeds—makes shifting easier.

Removable coupling allows clutch to be removed without disturbing engine or transmission.

Double clutch plates are metallic-faced for heavy-duty torque transmission.

Intake screens protect the oil pump from foreign material.



CLUTCH

CAT D9 TRACTOR: "We have operated this Cat D9 Tractor for 4,000 hours in the toughest kind of work without any repairs to the oil clutch," says Frank Hill of the Silva & Hill Construction Co., Los Angeles, California. "I just wouldn't consider buying a tractor without it now."

CAT NO. 955 TRAXCAVATOR: "In over 4,000 hours on our two hard-working No. 955 Traxcavators, we have made only one simple adjustment on an oil clutch and that took only about a half hour. It's much simpler than the old friction-type clutch," says M. J. Lutz of Bethel Park, Pennsylvania.

OWNERS REPORT TROUBLE-FREE OPERATION

CAT NO. 12 MOTOR GRADER: "Our No. 12 is starting its third season without interruption due to clutch trouble." With only one clutch adjustment in over 2,000 hours, Francis Bloomer, President of the John F. Bloomer Co., Appleton, Wisconsin, says, "We like the No. 12 with the oil clutch." This company, with 35 years of road construction work, owns a fleet of Cat-built equipment consisting of No. 12s, D9, D8s, DW21s.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co

LEADER IN EARTHMOVING RESEARCH

New **Longer-Wearing** Pattern in Wire Rope Styles!

After three years of extensive field trials this, the newest of Roebling's wire ropes, is now ready to go to work for you on a service basis that will exceed that of *the wire rope you are now using.*

Roebling Herringbone* combines the best features of both regular and Lang lay rope constructions; being made up of two *pairs* of Lang lay strands and two strands of regular lay. The regular lay strands separate the two pairs of Lang lay strands. Thus, in one rope you have the superior flexibility and abrasion resistance of Lang lay and the greater structural stability of regular lay.

For the past three years, under all kinds of conditions, Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. The results have been wonderful . . . excellent flexibility, exceptional resistance to shock and abrasion, smooth, easy operation around drums and over sheaves, smooth spooling properties and structural stability unequalled by other rope for the same job.

There has never been a better time—or a wider need—for a wire rope that returns so much service for its cost. And, in addition to being a top performer on the job, Herringbone eliminates the necessity of stocking Lang lay for one purpose and regular lay for another.

You are invited to get in touch with your Roebling distributor or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for further and fuller details on the *investment* qualities of this new and highly serviceable rope.

*Reg. appl. for

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation

This 110-B shovel digs and loads out 4,500 yards of copper ore and overburden every 8-hour shift in a western copper mining operation.

Get INSTANT EXTRA TORQUE to meet every load

Pace-setting Bucyrus-Erie mining shovels give you an electrical control system that speeds acceleration and deceleration on every move, gives instant, extra torque to meet the load, speeds every work cycle.

It's the Bucyrus-Erie improved Ward Leonard variable-voltage control system — job-proved and famous for outstanding results in major open pit mines all over the world.

Your operator commands every operation with well-grouped, simple controls for exceptionally smooth digging, swinging, hoisting, and propelling action. When you want speed . . . or torque . . . you GET it!

The result is more pit output at lower cost. Less mechanical and electrical maintenance, too. Write today for the complete story of these big Bucyrus-Erie electric mining shovels —4½-yd. 110-B, 6-yd. 150-B, 8-yd. 190-B. Bucyrus-Erie Company, South Milwaukee, Wisconsin.

192L58C

BUCYRUS ERIE

MODERNIZE to economize!

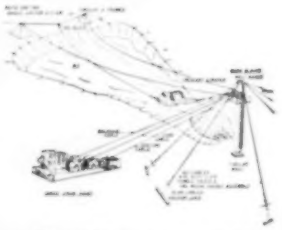
Cut Materials Handling Costs . . . Dig *and Haul* In One Operation With A SAUERMAN MACHINE

Digging and hauling are reduced to one continuous operation by using either a Sauerman DragScraper or Slackline Cableway. By combining the two basic steps of material flow, equipment and labor costs are halved—or even more. A single machine, controlled by one man, does the same job as the multiple equipment required by other methods.

Profitable handling is further assured by a low maintenance cost of 1½ cents per cu. yd. for an average size installation. Larger machines drop this cost still lower. Important, too, is the money saved on power. You pay only the cost of moving the actual digging tool—the Crescent DragScraper or Slackline bucket. Heavy machines with limited handling-to-dead weight capacity are eliminated.

General Handling, Wet or Dry— Pit or Hill Excavation and Reclamation

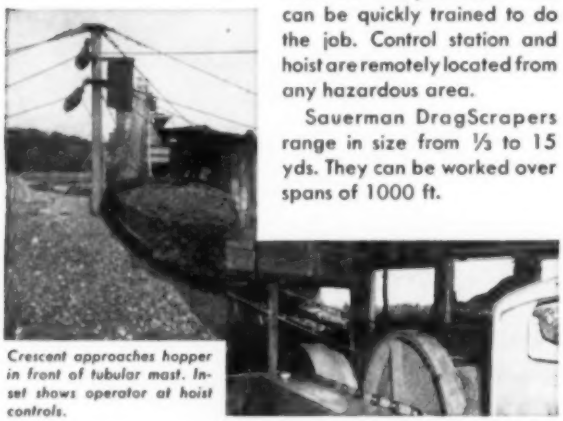
3-yd. DragScraper digs and hauls sand and gravel from pit to plant hopper over a distance of 400 ft.



A DragScraper is recommended for these and similar jobs. This machine handles the toughest digging and operates on a hillside or underwater with as much facility as dry level ground. It hauls directly to hopper, crusher or storage pile.

Operation is simple and safe. An inexperienced man can be quickly trained to do the job. Control station and hoist are remotely located from any hazardous area.

Sauerman DragScrapers range in size from ⅓ to 15 yds. They can be worked over spans of 1000 ft.



Crescent approaches hopper in front of tubular mast. Inset shows operator at hoist controls.

Deep Digging, Underwater Recovery— Conveying to High Delivery Point

This 1½-yd. Slackline Cableway is digging in 70 ft. of water and conveying to stockpile on an average haul of 600 ft.

When deep digging is required—or anticipated in the future—a Sauerman Slackline Cableway is the best machine. This powerful excavator can dig 100 ft. or more below water, lift its load and deliver to a high pile up to 1000 ft. away. This surge pile can be held in readiness for plant needs.

The bucket inhauls at high speed and dumps automatically. The dumping point is determined by a stop button on the track cable. Gravity returns the bucket to the digging point completing the fast operating cycle.

Sauerman Slackline Cableways range in size from ⅓ to 3½ cu. yds. Now available with torque convertor power, the Slackline is increasing its production over 25%.

Bucket automatically discharges onto a 60-ft. high cone pile. Mast in foreground rises 90 ft.

The best Sauerman Machine for your plant is governed by the nature of the deposit, location of material, the depth and plant layout. Why not consult Sauerman engineers about your plant? Their recommendations will be based on almost fifty years of sand and gravel excavating machinery experience. Ask for Catalog A (DragScrapers) and C (Slackline Cableways).

SAUERMAN BROS. INC. 622 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

CRESCENT SCRAPERS • SLACKLINE and TAUTLINE CABLEWAYS • DUROLITE BLOCKS

6 YARDS PER MINUTE WITH A 105 EXCAVATOR

Constructing a dam spillway involves a considerable amount of earth moving. It also presents loading problems because of extremely tight working quarters.

At a dam project, they had been moving earth, consisting mainly of decomposed shale, with ¾ yd. shovels loading from stockpiles pushed up by a bulldozer. In addition, the bulldozer had to rip the earth before dozing. This meant three separate operations — extra equipment tied up — an extremely costly, time-consuming job.

A versatile EIMCO 105 Excavator moved in — flying earth was all that could be seen from then on. The 105 overhead loader walked into the narrow spillway channel, started loading out 6-yard dumptors at the rate of one every 40 seconds — total time lapse for dumptor to move in, be loaded, move out: ONE MINUTE. The bulldozing and ripping operations were completely eliminated — production costs, equipment required, and time consumed were reduced to an absolute minimum.

EIMCO also manufactures a 105 Front End Loader with the same rugged construction and high production rates as the 105 Excavator. Write The EIMCO Corporation for detailed information on EIMCO high production, cost-saving 105 Loaders.

Eimco 105 Front End Loader.

THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N.Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Pittsburgh, Pa. Seattle, Wash.
Cleveland, Ohio London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-339

payload boost for SL dumper

now 13½ tons

for full particulars please apply for folder No. 1772/0

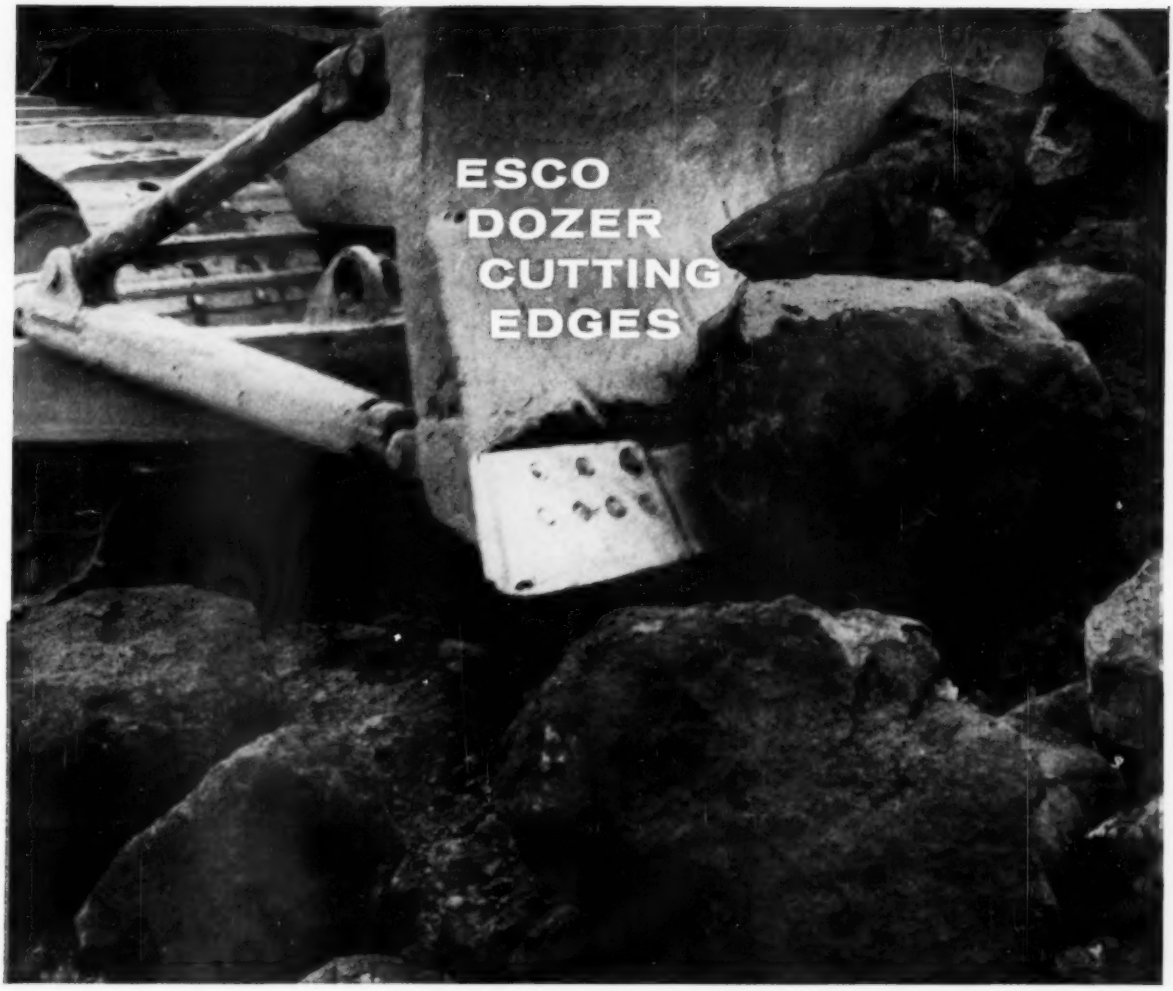
Re-inforced to carry additional weight, the re-designed Aveling-Barford "SL" now has a payload rating of 13½ tons. With increased capacity matched by power and strength, the "SL" dumper—unsurpassed for off-road performance—leads the field in economical heavy-duty earthmoving.

AVELING-BARFORD

ORIGINATORS & WORLD'S LARGEST MAKERS OF ROAD ROLLERS

SL heavy-duty **DUMPER**

AVELING-BARFORD LIMITED GRANTHAM ENGLAND



BUILT FOR BOULDER BUSTING BRUTES

Stop breakage problems on every kind of earthmoving job with tough, rugged *ESCO* Cast 12M Dozer Cutting Edges. *ESCO* Cast 12M Cutting Edges can take the severe punishment of longer pushes and rougher pioneering, even on the largest machines.

Careful heat treating of this *ESCO* steel alloy, 12M, makes *ESCO* Cutting Edges extra tough and hard *all the way through*. And, the same qualities that insure this breakage resistant toughness also impart amazingly high wear resistance.

You've really got the edge for low cost earthmoving and pioneering with *ESCO* Cast 12M Dozer Cutting Edges. Call your nearest *ESCO* dealer today for details.

ELECTRIC STEEL FOUNDRY COMPANY
2143 N. W. 25TH AVE. • PORTLAND 10, OREGON
MFG. PLANTS AT PORTLAND, ORE. AND DANVILLE, ILL.
Offices in Most Principal Cities
ESCO INTERNATIONAL, NEW YORK, N. Y.
IN CANADA ESCO LIMITED

He moves big yardage on housing development

with two self-loading 7-yd Allis-Chalmers motor scrapers . . . hauling 1,500 to 3,000 feet

K. L. Perry
K. L. Perry Excavating Co.

On a new development location for a big residential subdivision, K. L. Perry Excavating Company of Kansas City, Missouri, has found a new and profitable earth-moving team—two Allis-Chalmers TS-160 motor scrapers. Perry bought them on the basis of a demonstration which proved their maneuverability, speed and ability to self-load. Now the TS-160's have sold him on dependability and economy, too.

One of Perry's self-loaded TS-160's leaves the cut as the other returns to keep up the 1,000-yard-a-day pace on Vineyard Woods job.

Look ahead... *move ahead*...and stay ahead with

Short turning radius (less than 25 ft) and positive hydraulic control make maneuvering through tight spots a simple operation for Perry's TS-160's.

The TS-160 is the only motor scraper near its size available with forced ejection and extra high apron lift that assures easy ejection of toughest material.

TS-160's move dirt faster... cut operating costs in half

Earth-moving operations in modern housing developments have to move fast to keep costs low . . . and to set the pace for production line methods in home construction. On the Vineyard Woods job, for instance, to maintain the building program, Perry had to average 500 cubic yards per day, hauling up to 3,000 feet.

His two Allis-Chalmers TS-160 motor scrapers handled it with plenty to spare. Self-loading, they frequently topped 1,000-yard production daily. At the same time, operating costs were cut in half compared to his previous equipment. Perry says his Allis-Chalmers motor scrapers are big producers . . . helped him finish contracts days ahead of schedule. He now bids and makes a profit on contracts he couldn't consider before.

Self-loading, compactness and maneuverability make TS-160's naturals for development work

Primary factors in Perry's choice of Allis-Chalmers TS-160's were their demonstrated high-speed and self-loading ability. However, since he's had them, other benefits have become apparent. Perry is particularly pleased with their maneuverability. They turn in less than 25 feet—a valuable timesaver in limited space on many housing development operations. Hydraulic power steering makes maneuvering in tight quarters easy and efficient.

They also save time and money between jobs . . . move on highway at up to 25.4 mph. Operator comfort and ease of handling were noted as outstanding by Perry and his crew.

Performance sold the machines... dependability proved their value

K. L. Perry checked them all when he was in the market for high-speed dirt-moving equipment. He says, "We were sold by demonstration that the Allis-Chalmers machines were best—but the real proof came with performance like we had on the Vineyard Woods development in Kansas City. We've had only routine maintenance on the machines in eight months since we bought them. They put us in position to get the 500-home Kentucky Hill job at Independence, Missouri."

This TS-160 motor scraper story is a good example of the value in talking things over with your Allis-Chalmers construction machinery dealer. He knows the earth-moving business and can help you choose the machines that will help you most. Ask him for a demonstration right on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

ALLIS-CHALMERS

Excavating Engineer
founded 1905 AUGUST 1958

Mile long quarry at North Branford, Conn., has produced over 21 million tons of crushed trap rock since operations began in 1914.

New England's Largest Stone Producer

by Syd Jamieson

MENTION trap rock to contractors in the southern New England area, and most of them will automatically think of The New Haven Trap Rock Co. of New Haven, Conn.

Recognized as the largest producer of crushed stone in New England, this firm furnished two million tons of crushed stone and a half-million tons of bituminous concrete mix for the recently completed Connecticut Turnpike—some 77 miles of superhighway running from Greenwich to Saybrook, Conn.

During peak operations on the turnpike job, 12,000 tons of crushed stone per day were hauled by truck alone from the company's quarries at North Branford, Wallingford and Plainville, Conn. By all methods of shipment (rail, water and truck) during construction of the turnpike, a maximum of 30,000 tons per day was shipped throughout Connecticut and southern New England, New York and New Jersey.

The mile-long quarry at North Branford alone—the largest trap rock open quarry face in the world—has produced over 21 million tons of crushed trap rock since the firm began operations in 1914.

Crushed trap rock is considered among the most economical and important building materials available to the construction industry. One of the strongest aggregates, crushed trap rock is uniform in quality, insuring contractors a consistent supply of superior

New Haven (Conn.) firm relies on 2½ and 3-yd. shovels to keep production high at its three widely scattered quarries. Plants turn out total of nearly 1,200 tph of finished product.

quality material. It is used in the construction of roads, bridges, buildings, airports, railroad ballast and sewage treatment plants. It is also in demand for jetties and breakwaters along coastal areas.

The formation of columnar trap rock at the firm's three quarries is the result of the geological development of the Connecticut River Valley, site of the New England Alps about 200 million years ago. Through the ages, this area was worn down to a level plain by weathering. Pressures in the earth then shifted, pushing up the earth's crust and forming a ridge of mountains to the east, with a basin lying westward. During this period, volcanic activity predominated, and lava flows, exuding from the volcanoes, covered the entire area with sheets of lava. These volcanic flows are the trap rock now being quarried at Wallingford, Plainville and North Branford. The silhouettes of the steplike structure show the rugged resistance to centuries of wearing action by glaciers, wind, water and chemicals. Because of this "step" formation, the word "trappe" was probably derived from the Scandinavian and thus the generic term "trap rock."

Rock Content

Chemical analysis shows the stone is composed of these essential minerals: 33.4% augite, 32.8% plagioclasse and 11.6% olivine; secondary minerals 14.0% kaolin, 5.6% serpentine and limonite; and an accessory mineral, magnetic oxide of iron (2.6% magnetite).

Operating heights vary at the three quarries. At North Branford height is from 65 to 110 feet; Wallingford as much as 270 feet; and Plainville over 150 feet. Earth overburden (6 to 8 feet) is removed with tractors and scrapers on a contracting basis. The life expectancy of quarry production at all three sites is estimated to be from 200 to 250 years.

Diesel powered 3-yd. Bucyrus-Erie 71-B shovel loads out a 17-yd. end-dump truck in the pit at company's Wallingford plant. Shovel produces about 300 tons per hour.

Outdoor ad sign indicates the firm provided stone for the Connecticut turnpike.

The New Haven Trap Rock Co. relies heavily on performance of 2½-yd. and 3-yd. shovels for loading in the pits. Yearly production has shown it is more feasible to use a number of such smaller shovels, rather than a single shovel with larger dipper capacity. Reasoning for this is foresight to possible maintenance problems. A single shovel could hamper plant capacity if idle due to repairs. However, by employing such smaller units, each capable of loading and cleanup work, a 90% capacity of plant operation can be maintained, even with one unit down.

According to R. D. Brewer, superintendent at North Branford, "Anything our 2½-yd. dippers load our crushers can handle, and it provides us with a more flexible operation."

Loading stone into side-dumps at North Branford centers around a 2½-yd. Bucyrus-Erie 54-B electric shovel and a diesel-powered 54-B. A P&H 955A diesel completes the third unit for pit loading. The three units interchange as needed, with two shovels maintaining production while the third does cleanup work in the pit. At Wallingford, a 3-yd. Bucyrus-Erie 71-B produces about 300 tons per hour and a P&H 955A averages approximately 250 tons per hour. Both units are diesel powered. This plant details cleanup work and stockpiling to its 1½-yd. Bucyrus-Erie 38-B diesel. At the company's Plainville quarry, it's

Nine 42-T churn drills and an Ingersoll-Rand Drillmaster handle primary drilling requirements at the firm's three quarries.

a one shovel operation due to smaller production. Here a 2½-yd. P&H 955A loads from 275 to 300 tons per hour. At all three quarries, pit men are assigned to each unit.

Plant capacity at North Branford runs about 550 tons per hour, 400 tons per hour at Wallingford with Plainville producing 250 tons per hour.

Stockpiles of crushed rock are maintained at each plant. Loading units at North Branford include one ¾-yd. Lorain 25K diesel and two Michigan 75A front-end loaders. Wallingford keeps three machines busy loading out stockpiles. This team includes a 1½-yd. Bucyrus-Erie 38-B diesel, a Michigan front-end loader with 2½-yd. scoop and a 1½-yd. 75B Lorain gasoline-powered shovel. Stockpiling for the Plainville plant is handled by a Michigan 175A and a Hough HMD front-end loader teamed with a Brownhoist model 2 using a 1½-yd. clamshell bucket.

All of The New Haven Trap Rock Co. drilling is contracted to the Gill Blast Hole Drilling Co., North Branford. One of the largest drilling contractors in the East, this company works in close liaison with plant engineers. Successful blasting techniques at The

HISTORY

The New Haven Trap Rock Co. was founded in 1914 with the development of a quarry and crushing plant on Totoket Mountain in North Branford. Totoket Mountain is located on Long Island Sound, about six miles north of Pine Orchard and four miles from the main line of the New York, New Haven and Hartford Railroad.

To transport the crushed stone from the quarry at North Branford to the railroad line for shipment, it was necessary to build a connecting link which would join North Branford with the New York, New Haven and Hartford. In existence at that time was the Damascus Railroad, which ran north toward the quarry from the main line railroad. The Damascus line was originally built to transport racing fans to a trotting track in Branford. To complete a connecting line, it was necessary to merely extend the track from the intersection of the two railroads southward to Long Island Sound and northward, from the site of the trotting racetrack in North Branford, to Totoket Mountain. This task was accomplished by 1915, and the connecting line operates to this day as the Branford Steam Railroad.

During this early period, the Pine Orchard Harbor was also developed. A dock terminal was constructed to permit loading of deck scows, which transported stone to Cape Cod, Long Island and into New Jersey. Trucks had not been developed at that time to a point where they could be used effectively. Hard rubber tires made it difficult to travel over dirt roads, especially on long hauls. The use of railroad steam shovels at that time, to load stone from the pit, delayed production schedules because a constant relocation of tracks was necessary.

With the introduction of pneumatic tires and improved truck body design and the introduction of track-type shovels, it became possible to ship larger quantities of stone by truck and improve quarry production in the pit proper.

In 1935, The New Haven Trap Rock Co. merged with Connecticut Quarries Co. Today the firm's plant operations include the quarries at Wallingford and Plainville, where operations began before 1900, as well as the original plant at North Branford.

Lima 101 crane loads large chunks of rock into a customer's truck at North Branford plant. Rock will be placed along coast at Southport, Conn., to prevent shore erosion.

Looking over operations at Plainville are R. H. Green, safety engineer (left), and T. W. Jones, vice president in charge of production for the New Haven firm.

New Haven Trap Rock Co. are the results of careful research, analysis and detailed reporting of all blasting operations. Great importance is given to accuracy and attention to details, regardless how big or how small the problem.

"If these factors are observed," explains Ray Green, safety engineer, "the results of the primary blasts can be better anticipated. In many cases," he added, "fragmentation is tailored to suit the needs of the season and the type of equipment the rock is going to be processed in. In short," he said, "safer and more efficient blasting." Repeatedly Green emphasized that the importance in a good drilling operation lies not only in getting the hole down to the proper depth, but getting it precisely where the engineering efforts have indicated it should be.

Nine Bucyrus-Erie 42-T churn drills and an Ingersoll-Rand Drillmaster provide the initial work for production drilling at all three quarries. Hole spacing at North Branford is 32 x 24 feet, with an average depth of from 65 to 112 feet. Hole diameter for this operation is 9¼ inches.

Depth averages of holes at Wallingford are greater than those at North Branford. Here depth ranges from 111 to 260 feet. Hole diameter is 6½ inches. At Plainville, hole spacing is only 18 feet x 20 feet.

The New Haven Trap Rock Co. has begun to split the present quarry face at Plainville into two benches, so faces will be 85 feet high rather than the former 150 feet. Average hole depth here is from 85 to 90 feet. The rate of penetration is about 3½ feet per hour for the 42-T churn drills.

The Ingersoll-Rand Drillmaster uses 6½-in. carbide bits. The churn drill bits are supplied by the Gill Rock Bit Co., Lebanon, Pa. Through this supplier, Gill Blast Hole Drilling Co. is serviced with shop sharpened bits. Two equipment maintenance men are employed at North Branford. Supervision is provided by a general superintendent and a drill foreman.

The New Haven Trap Rock Co. quarries require very little secondary drilling. If necessary, a drop ball is used for most of the secondary breakage. If secondary drilling and blasting are required, 1½ x 8-in. sticks of 60% special gelatin-type explosive are used in jackhammer holes.

Explosives are DuPont Nitramon products with Nitramex number 2H placed in the bottom portion of the hole. In the top is Nitramon number 2, or fertilizer-grade prilled ammonium nitrate. Detonation is done with Nitramon primers. Holes are surface-primed with Primacord and delayed with DuPont MS connectors which are set off by two electric blasting caps.

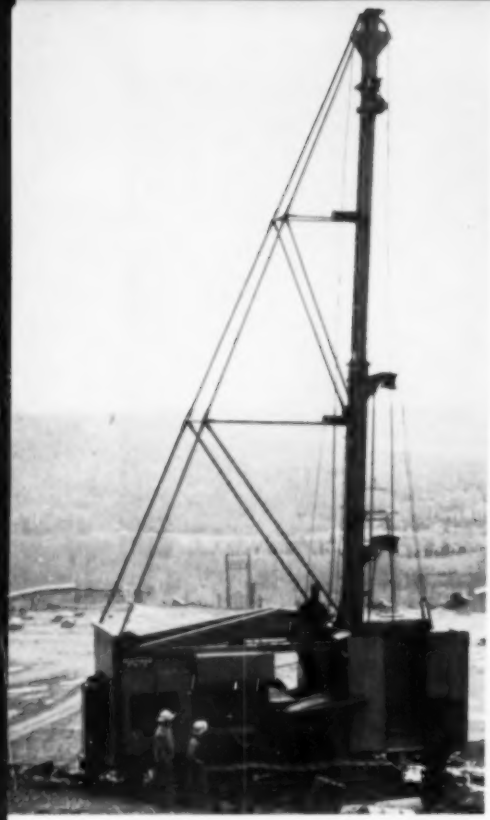
"The quantity of explosives per hole," said Safety Engineer Green, "will range from as little as 800 pounds at our Plainville site to 6,000 pounds at the highest portion of the face at Wallingford. In general," he said, "our shots yield three tons of rock for every pound of explosive." He explained that due to the company's effort to foster good public relations at Plainville, "we have voluntarily limited ourselves to 8,000 pounds per shot. This means about nine 6½-in. holes for each blast. However," he added, "we shoot 40 or more 9-in. holes per shot at the North Branford quarry."

Good Fragmentation

According to Green, New Haven Trap Rock Co. engineers have had excellent fragmentation results with their methods.

The majority of hauling at the quarries is done with Euclid side or end-dump trucks of 15 to 17-ton capacity. North Branford uses three Eucs, and Cummins-powered Mack and Autocar trucks. Wallingford has four self-dumping Eucs: one 63-TD; a 91-FD; an 8-TD and a 3-TD. Hauling cycles vary at each of the plants. The portion of the North Branford quarry presently being worked requires hauls up to 3,000 feet. The longest haul at Wallingford is about 1,000 feet. Average haul length at Plainville is 1,200 feet, where the truck

A 2½-yd. 54-B electric shovel loads an Easton side-dump trailer pulled by Autocar truck at the North Branford pit. Round-trip haul to crushing plant is about 3,000 feet.



Nine 42-T churn drills and an Ingersoll-Rand Drillmaster handle primary drilling requirements at the firm's three quarries.

a one shovel operation due to smaller production. Here a 2½-yd. P&H 955A loads from 275 to 300 tons per hour. At all three quarries, pit men are assigned to each unit.

Plant capacity at North Branford runs about 550 tons per hour, 400 tons per hour at Wallingford with Plainville producing 250 tons per hour.

Stockpiles of crushed rock are maintained at each plant. Loading units at North Branford include one ¾-yd. Lorain 25K diesel and two Michigan 75A front-end loaders. Wallingford keeps three machines busy loading out stockpiles. This team includes a 1½-yd. Bucyrus-Erie 38-B diesel, a Michigan front-end loader with 2½-yd. scoop and a 1½-yd. 75B Lorain gasoline-powered shovel. Stockpiling for the Plainville plant is handled by a Michigan 175A and a Hough HMD front-end loader teamed with a Brownhoist model 2 using a 1½-yd. clamshell bucket.

All of The New Haven Trap Rock Co. drilling is contracted to the Gill Blast Hole Drilling Co., North Branford. One of the largest drilling contractors in the East, this company works in close liaison with plant engineers. Successful blasting techniques at The

HISTORY

The New Haven Trap Rock Co. was founded in 1914 with the development of a quarry and crushing plant on Totoket Mountain in North Branford. Totoket Mountain is located on Long Island Sound, about six miles north of Pine Orchard and four miles from the main line of the New York, New Haven and Hartford Railroad.

To transport the crushed stone from the quarry at North Branford to the railroad line for shipment, it was necessary to build a connecting link which would join North Branford with the New York, New Haven and Hartford. In existence at that time was the Damascus Railroad, which ran north toward the quarry from the main line railroad. The Damascus line was originally built to transport racing fans to a trotting track in Branford. To complete a connecting line, it was necessary to merely extend the track from the intersection of the two railroads southward to Long Island Sound and northward, from the site of the trotting racetrack in North Branford, to Totoket Mountain. This task was accomplished by 1915, and the connecting line operates to this day as the Branford Steam Railroad.

During this early period, the Pine Orchard Harbor was also developed. A dock terminal was constructed to permit loading of deck scows, which transported stone to Cape Cod, Long Island and into New Jersey. Trucks had not been developed at that time to a point where they could be used effectively. Hard rubber tires made it difficult to travel over dirt roads, especially on long hauls. The use of railroad steam shovels at that time, to load stone from the pit, delayed production schedules because a constant relocation of tracks was necessary.

With the introduction of pneumatic tires and improved truck body design and the introduction of track-type shovels, it became possible to ship larger quantities of stone by truck and improve quarry production in the pit proper.

In 1935, The New Haven Trap Rock Co. merged with Connecticut Quarries Co. Today the firm's plant operations include the quarries at Wallingford and Plainville, where operations began before 1900, as well as the original plant at North Branford.

Lima 101 crane loads large chunks of rock into a customer's truck at North Branford plant. Rock will be placed along coast at Southport, Conn., to prevent shore erosion.

Looking over operations at Plainville are R. H. Green, safety engineer (left), and T. W. Jones, vice president in charge of production for the New Haven firm.

New Haven Trap Rock Co. are the results of careful research, analysis and detailed reporting of all blasting operations. Great importance is given to accuracy and attention to details, regardless how big or how small the problem.

"If these factors are observed," explains Ray Green, safety engineer, "the results of the primary blasts can be better anticipated. In many cases," he added, "fragmentation is tailored to suit the needs of the season and the type of equipment the rock is going to be processed in. In short," he said, "safer and more efficient blasting." Repeatedly Green emphasized that the importance in a good drilling operation lies not only in getting the hole down to the proper depth, but getting it precisely where the engineering efforts have indicated it should be.

Nine Bucyrus-Erie 42-T churn drills and an Ingersoll-Rand Drillmaster provide the initial work for production drilling at all three quarries. Hole spacing at North Branford is 32 x 24 feet, with an average depth of from 65 to 112 feet. Hole diameter for this operation is 9¼ inches.

Depth averages of holes at Wallingford are greater than those at North Branford. Here depth ranges from 111 to 260 feet. Hole diameter is 6½ inches. At Plainville, hole spacing is only 18 feet x 20 feet.

The New Haven Trap Rock Co. has begun to split the present quarry face at Plainville into two benches, so faces will be 85 feet high rather than the former 150 feet. Average hole depth here is from 85 to 90 feet. The rate of penetration is about 3½ feet per hour for the 42-T churn drills.

The Ingersoll-Rand Drillmaster uses 6½-in. carbide bits. The churn drill bits are supplied by the Gill Rock Bit Co., Lebanon, Pa. Through this supplier, Gill Blast Hole Drilling Co. is serviced with shop sharpened bits. Two equipment maintenance men are employed at North Branford. Supervision is provided by a general superintendent and a drill foreman.

The New Haven Trap Rock Co. quarries require very little secondary drilling. If necessary, a drop ball is used for most of the secondary breakage. If secondary drilling and blasting are required, 1½ x 8-in. sticks of 60% special gelatin-type explosive are used in jackhammer holes.

Explosives are DuPont Nitramon products with Nitramex number 2H placed in the bottom portion of the hole. In the top is Nitramon number 2, or fertilizer-grade prilled ammonium nitrate. Detonation is done with Nitramon primers. Holes are surface-primed with Primacord and delayed with DuPont MS connectors which are set off by two electric blasting caps.

"The quantity of explosives per hole," said Safety Engineer Green, "will range from as little as 800 pounds at our Plainville site to 6,000 pounds at the highest portion of the face at Wallingford. In general," he said, "our shots yield three tons of rock for every pound of explosive." He explained that due to the company's effort to foster good public relations at Plainville, "we have voluntarily limited ourselves to 8,000 pounds per shot. This means about nine 6½-in. holes for each blast. However," he added, "we shoot 40 or more 9-in. holes per shot at the North Branford quarry."

Good Fragmentation

According to Green, New Haven Trap Rock Co. engineers have had excellent fragmentation results with their methods.

The majority of hauling at the quarries is done with Euclid side or end-dump trucks of 15 to 17-ton capacity. North Branford uses three Eucs, and Cummins-powered Mack and Autocar trucks. Wallingford has four self-dumping Eucs: one 63-TD; a 91-FD; an 8-TD and a 3-TD. Hauling cycles vary at each of the plants. The portion of the North Branford quarry presently being worked requires hauls up to 3,000 feet. The longest haul at Wallingford is about 1,000 feet. Average haul length at Plainville is 1,200 feet, where the truck

A 2½-yd. 54-B electric shovel loads an Easton side-dump trailer pulled by Autocar truck at the North Branford pit. Round-trip haul to crushing plant is about 3,000 feet.

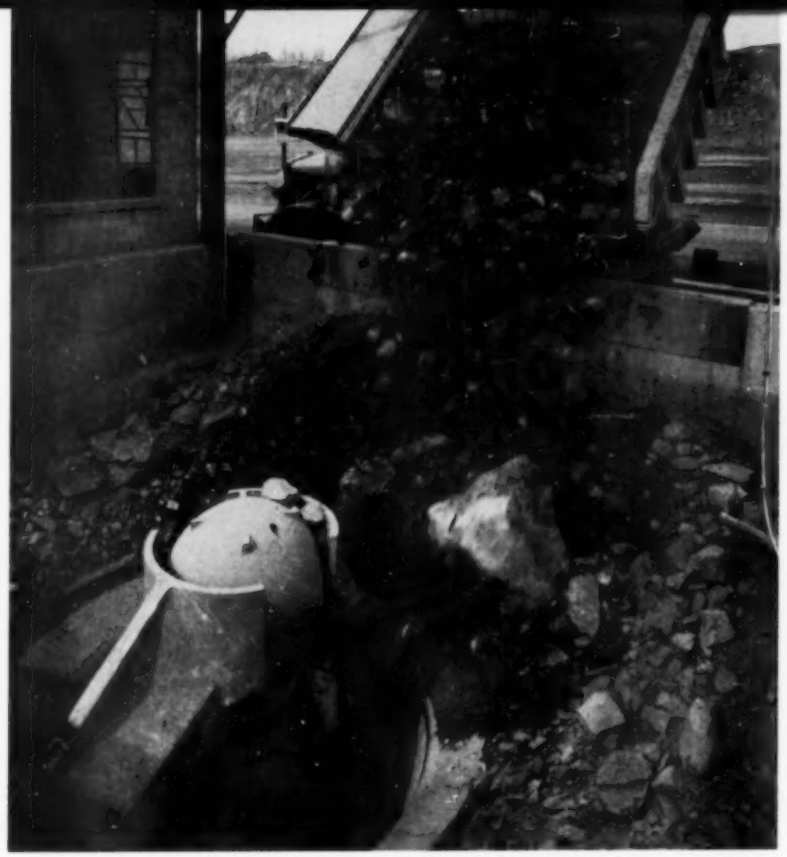
time cycle is clocked at five minutes.

Because the North Branford plant originally started as a railroad operation, it was simply a matter of changeover from rail to pneumatic equipment for side dumping into hoppers. An Easton electric dump hoist is used to dump the stone from the trailer units.

Last year New Haven Trap Rock Co. installed a completely new primary crushing operation at North Branford. This initiated a program to increase capacity of the whole plant. The primary crushing and scalping capacity is estimated at 1,000 tons per hour.

Trap rock is fed directly into an Allis-Chalmers 42-65 Superior gyratory. From this primary crusher, it is carried by a 48-in. Hewitt belt conveyor to a 6 x 16-ft. Robins screen for primary scalping. Located below this screen is a 5 x 14-ft. Robins Vibrex used for removing wet fines in rainy weather. This enables New Haven to produce a cleaner product in any season. The material passing through the screen by-passes the entire mill and arrives at the screen house for sizing. The overs retained on the screen are carried by another 48-in. conveyor belt to the surge pile. Feed for the 7-ft. Symons standard cone crusher (500 to 600 tons capacity per hour) is carried from the surge pile on a 48-in. conveyor.

From the Symons crusher it travels on a 36-in. rubber belt to a Robins Gyrex 6 x 16-ft. double-deck screen. The throughs proceed to the screen house for sizing. All the material passing through primary and secondary scalping screens is minus 2¼-in. size. The overs retained on the secondary scalper remain in a closed circuit between the secondary scalper and the 7-ft. Symons crusher until they are reduced to passing 2¼-in. screen. The unsized material is then carried by a 36-in. conveyor to the screen house. There it is fed first to two 5 x 14-ft. double-deck Tyrocks. The top deck retains the 2¼-in. material and passes minus 1¼-in. material. The bottom deck retains 1¼-in. stone and passes minus ¾-in. stone. This minus ¾-in. product is carried on a 24-in. conveyor belt to the two Seco 5 x 16-ft. double-deck screens. The top deck retains ¾-in. material. The bottom deck keeps the ½-in. material and passes anything ⅜-in. in size. Stone passing the bottom deck is sent by gravity to the two Robins Gyrex 4 x 8-ft. single-deck screens. The ⅜-in. material is retained; and ⅛-in. stones are throughs.



A Euclid side-dump empties its load into an Allis-Chalmers 42-65 Superior gyratory crusher at the North Branford plant. Capacity of the crusher is 1,000 tons per hour.

Increase Capacity

A few years ago, to increase the small stone capacity of the screen, a 5 x 16-ft. triple-deck Robins vibrating

Above is a general view of the crushing plant at Wallingford. At left a 17-yd. Euclid loads railroad cars with finished product.

screen mounted on a 400-ton Blaw-Knox steel bin was added. This installation takes some of the feed passing the bottom decks of the 5 x 14-ft. Tyrox screens.

At the Plainville plant, rock is dumped into a 4 x 15-ft. Traylor apron feeder. This rock is directed to a Buchanan 42 x 54-in. primary jaw crusher. The material is then carried by conveyor to the primary scalper, a 4 x 8-ft. single-deck Robins Gyrex. The throughs are carried up to the screen house. Overs that are retained are fed to a 5½-ft. Symons standard cone crusher for secondary crushing. The discharge from the Symons crusher is carried on a 30-in. conveyor belt to a 5 x 12-ft. double-deck Robins Gyrex for secondary scalping. Remaining in closed circuit, the top deck holds the very course material while the balance is sized in the bottom deck. The minus 2¼-in. stone passing through this screen is carried on a 24-in. conveyor to the screen house, where the feed is split and discharges onto two 4 x 12-ft. triple-deck Robins Gyrex screens. Here the top deck is a relieving deck while the middle deck retains 2¼-in. material. Throughs are of 1½-in. size.

In this operation the bottom deck then passes the ¾-in. size and holds the 1½-in. material. The throughs go to the two Tyrox 4 x 12-ft. triple-deck screens. The top deck retains ¾-in. stone, but as it does, separates the ½-in. material. This size is held in the middle deck. The middle deck then passes the ¾-in. stone and this material separates to the bottom deck, which passes the ⅛-in. throughs.

Feed at the Wallingford operation is dumped into a 5 x 20-ft. Telsmith apron feeder. From the feeder it goes to a 48 x 60-in. Farrel-Bacon primary jaw crusher. From the crusher this material is carried to the secondary crushing operation, performed by a Symons 7-ft. standard cone type crusher. Primary scalping operations are handled by a Robins Hi-G 5 x 12-ft. double-deck screen. Located below this screen is a 5 x 14-ft. Robins vibrex used for removing wet fines in rainy weather. This is the same installation used at North Branford. Additional sizing screens include a Robins Hi-G 6 x 20-ft. double-deck; two 5 x 12-ft. Robins Gyrex double-deck screens; and a Robins Vi-

Continued on page 53

Stockpiles of crushed rock are maintained at the Plainville plant by this Michigan 175A front-end loader, a Hough HMD loader and a Brownhoist model 2 crane.

Heatherington-Berner batching plant at North Branford produces bituminous mix.

Cranes Set 45-Ton Prestressed Beams for Tollway Bridge

Cunningham-Kiewit-Paschen combine builds mile-long dual bridge on Illinois' Tri-State tollway. Job includes erecting seven miles of concrete beams and constructing 106 bridge piers.

SOUTHWEST of Chicago, the longest structure on the new $441 million Illinois toll highway is rising. The structure is a bridge, slightly more than .9 of a mile long, which crosses the Chicago Sanitary and Ship Canal; the Illinois-Michigan Canal; the Des Plaines River; the Santa Fe railroad; and the Gulf, Mobile & Ohio railroad. It is located south of LaGrange, Ill., near the intersection of U.S. routes 45 and 66.

Dual roadways, each containing two traffic lanes, will carry vehicles using the Tri-State tollway swiftly and safely above those water and rail transportation arteries. The big structure is being built by a joint venture of three firms —Condon-Cunningham Co. and Peter Kiewit Sons' Co., both of Omaha, Neb., and Paschen Contractors, Inc., Chicago.

Its total cost will be about $5 million, including structural steel furnished and erected by Bethlehem Steel Co. The Cunningham-Kiewit-Paschen contract will run about $3.5 million, including extras and over-runs. The same joint venture also has an $8.3 million five-mile long roadway and structures contract at the southern end of the super-toll road.

The Tri-State tollway is an 84-mile long segment of the 187-mile long Illinois toll highway system. As the name implies, the Tri-State route is designed to speed traffic between three states—Illinois, Indiana and Wisconsin. All of its mileage, however, is located within the state of Illinois.

Opens December 31

Specific purpose of the Tri-State is to serve as a belt route around Chicago. It will enable motorists to bypass the heavily congested metropolitan area on limited-access, high speed pavements. Opening of the Tri-State is scheduled for December 31.

The construction section on which the bridge is located is known as contract T-4A. The engineering firm responsible for its design and construction supervision is Maccabee, Campbell & Associates, Chicago.

Outstanding design feature of the bridge is the predominant use of precast, prestressed concrete beams to carry the roadway decks. More than seven miles—37,988 linear feet—of the concrete beams are necessary. They are I-shaped and four feet deep. There are six beams to a span. The beams range in length from 51 feet 4 inches to 88 feet 10 inches. Average weight is about 45 tons.

An 85-ft. beam is hauled from nearby casting yard by White Bros. Trucking Co. The subcontractor uses special telescoping trailers pulled by International K-190 trucks.

Erecting of the concrete beams—there are exactly 456 of them—was begun by a pair of Bucyrus-Erie 71-B cranes on March 17, 1958. The heavy cranes were expected to finish the job by August 1.

While the normal erecting time for this number of beams would be about six weeks, according to the contractor, the actual time on this job is taking much longer because of the slow rate of delivery of the beams from manufacturers.

Personnel on the lifting team are Wilbur Neely, crane maintenance superintendent, who runs one 71-B, and James Campbell, operator on the second machine. Both cranemen exercise extreme care in picking up the beams. The beams cannot be set down on the ground

From time beam arrives on job, erecting takes 71-B cranes working as a team less than 30 minutes. The cranes have 60-ft. booms and are rigged with 6-part lines.

at any time without special blocking. If a beam was deliberately balanced on some object at about its midpoint, it would snap in two.

Strange as it seems, the beams nevertheless are fully adequate to take the load of traffic. When set into place, the beams are designed to carry the same load as an all-steel girder.

These prestressed units come equipped with lifting rings—heavy 2¼-in. diameter U-bars—cast into each end to simplify the handling task.

The beams are not perfectly flat but have a 7/16 to ⅝-in. camber, which levels out when the concrete deck is poured over them.

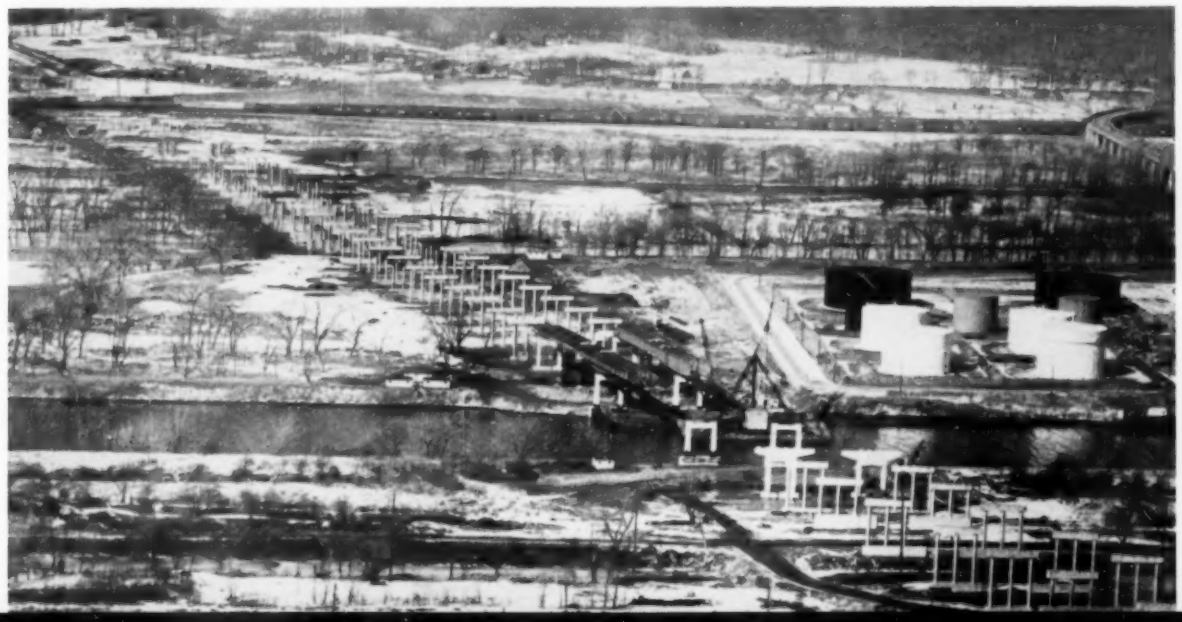
Because concrete expands and contracts with changes in temperature just as steel does, each beam must be installed with one end fixed and the other end with an expansion joint. On the fixed end, the beam is held in position by being cast into a mass of concrete. On the expansion end, the beam is free to move forward or backward on a special base plate, leaving a gap of 3 to 5 inches between adjoining beams.

Fixing Technique

Here's how the beams rest on the pier caps. On the pier where the fixed end of the beam will be placed, a masonry pad in the substructure is ground level and smooth and then a hard rubber pad is placed on the ground area. The bottom flange of the concrete beam is set directly on the rubber pad. The bearing is "fixed" by forming and pouring a reinforced concrete diaphragm which encases the ends of all beams on the pier and permanently establishes their position. When the diaphragms develop strength, they create a composite action between the beams in adjacent spans and the pier itself. The diaphragms, in effect, transform the simple girder spans into a two-span continuous bridge for live-load calculations.

The expansion end of the beams is furnished with a sole plate. As with the fixed end, the masonry pad is leveled and a rubber pad is placed in position. The special base plate is set on the rub-

View taken from helicopter shows how the mile-long bridge will carry Tri-State Tollway traffic above rail and water barriers.



Here is a typical casting bed for prestressed beams. Wire cable in foreground is stretched taut through concrete mold to give beams strength to resist bending forces.

ber pad. The beam is erected in such a position that the sole plate bears directly on the base plate. This is not a bolted connection—the girder is free to slide over the base plate as it expands and contracts. The plates do constrain the girders from lateral movement, however. Also, a smaller cast-in-place diaphragm is poured between the expansion ends of girders in each span to permanently maintain the proper spacing between beams.

Crane Superintendent Neely reports the two 71-B machines, working as a team, have plenty of power and capacity for moving the 45-ton beams. Both machines are powered by General Motors 6-110 diesel engines which drive through Torcon torque converters. Boom length is 60 feet and the loads are picked up at a 25-ft. operating radius with the boom set at an angle of 68° or more. A special 70-ton block is used and it is rigged with six-part line. Crosby-Laughlin shackles with a rated capacity of 35 tons (equipped with a 2¼-in. pin) are hung on the crane blocks and these shackles are attached to the lifting rings cast into the beam.

The entire erecting cycle, from the time the beam arrives on the job, takes less than 15 minutes. The beams, which are supplied to the job by the Lewiston Pipe Div., American Marietta Corp., under a supply contract with the toll highway commission, are hauled in from a casting yard located at nearby Hodgkins, Ill. The long, delicate castings are borne on telescoping trailers pulled by International K-190 trucks. Trucking contractor is a joint venture of White Brothers and Freer Motor Transfer Co., both of the Chicago area.

The trailers are parked between the cranes and the piers where the beams are to be set. After the shackles are attached, the cranes hoist the beam clear of the trailer and the truck pulls clear of the load. Next, the cranes walk up close to the pier, hoist the beam up to the height of the pier and finally move into the point where the beams are to be lowered. Then slowly and steadily they power-lower the load exactly into position so that the base of the beam is properly spotted on the pier cap.

Coordination Important

"The operation is easy, once you get the right coordination between crane operators," Neely explained. "That young fellow running the other crane and myself work together pretty well as a team. The cranes mean a lot, too. They've got a wonderful set of brakes as far as the load is concerned. They also have plenty of power for propel after hoisting the 45-ton load."

The "young fellow" Neely was referring to is 25-year-old James Campbell, who with several years of experience behind him has become a good, reliable crane operator under Neely's guidance. Neely himself is one of Condon-Cunningham's oldest and most talented cranemen. He started with the firm in 1928, and prior to that worked as an operator of a Monighan walking dragline in a strip mine. Although he no longer is a regular crane operator since he usually devotes full time to supervising machine maintenance, he took over the job of lead-man on the beam-setting job because of the degree of skill required.

On a good day when the beams come in on schedule, Neely and Campbell can

Superintendent Esco Choisser (left), Project Manager James Wilson and Project Engineer Roswell Howard head Condon-Cunningham Co. personnel on the bridge job.

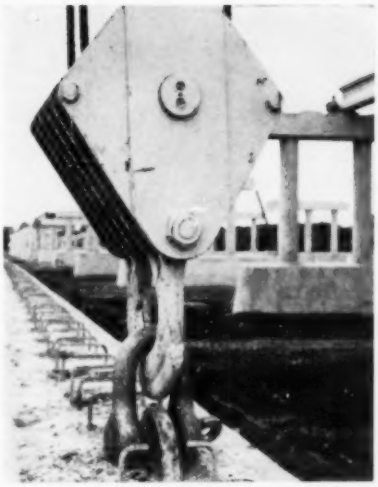
easily set 16 or 18. This figure takes into consideration delays in moving up the cranes and in shifting erectors from pier to pier. In fact, on May 19 a total of 24 beams was set in six hours.

The cranes themselves have an interesting work history. One 71-B, owned by Peter Kiewit Sons' Co., was shipped to Chicago from Buffalo, N. Y. It had worked on the Long Sault Channel excavation phase of the St. Lawrence Seaway project near Massena, N. Y. About 13 million yards of material were dug from a five-mile stretch of the Seaway channel by Kiewit in joint venture with Morrison-Knudsen, Inc., Boise, Idaho.

According to an hour meter mounted on its engine, the crane had put in 15,300 operating hours on the Seaway.

The second 71-B owned by Condon-Cunningham came to the Tri-State tollway from Gary, Ind., where it worked on the Indiana toll road. The machine worked 1,600 hours equipped as a dragline loading borrow for the toll road. Its engine has been going 10,000 hours without an overhaul.

Because of the constant flow of traffic both by rail and water across the job site, plus the presence of one of the country's hottest high voltage power lines and several oil and gas pipelines, work was subject to frequent interruption and crews had to be extra alert constantly.



Lifting rings cast into beam ends simplify handling. Crosby-Laughlin shackles with 2¼-in. dia. pin are attached to rings.

Project Manager James L. Wilson said cooperation of private firms and government agencies concerned was excellent. For instance, although a freight switching yard cut across the access road at one point, the railroad issued special orders to its crews to keep the crossing open as much as possible and not to block it for more than a few minutes at a time. Similarly at night, crews were careful not to leave rail cars strung across the haul road.

Pipeline companies assisted by marking off with stakes the locations of their lines. Chicago District Pipeline Co. had three such pipes on the site. One of them—a 30-in. natural gas line—had to be relocated. Standard Oil Co. (Indiana) and Badger Oil Co. also had crude oil lines in the area.

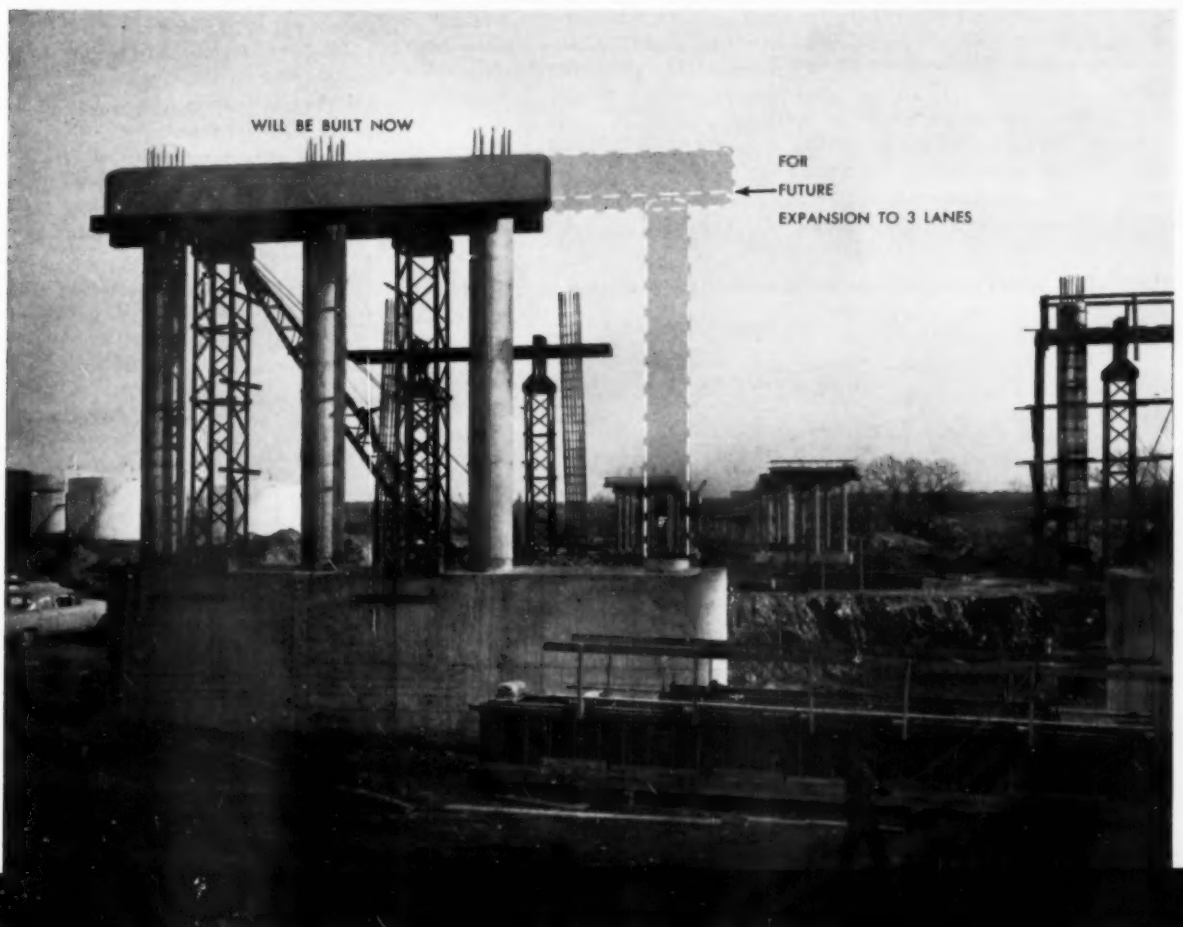
Work Under Towers

According to Project Engineer Roswell Howard, a 220-kv power line from Commonwealth Edison's generating plant on the Calumet River is carried on high tension towers across the right-of-way. "In fact," Howard said, "one bridge pier is going up right under the lines."

Commonwealth Edison issued warnings to the effect that the line had an electrical load as heavy as that now carried by any urban transmission line in the United States. "We can't say for sure whether this claim is true," Howard said. "Maybe the utility was trying to put a good scare into us. But at any rate, our crews are taking no chances, and that certainly is a good thing."

Project Manager Wilson has eight cranes on the job for all types of digging and lifting tasks. Heading the spread are the two 71-B cranes, the

Pier structures contain built-in provisions for future widening of road to three lanes. Extra column can be installed on pier block.



Crane Superintendent Wilbur Neely (left) and Iron Supt. Ben Bryson pause for job talk between delivery of beams.

largest machines on the job. In addition to the present assignment, one of the cranes which is equipped with 15-ft. jib occasionally helps pour concrete.

Two Northwest 80-D's equipped with 2½-yd. Hendrix and Esco dragline buckets handled all the structural excavation, with the assistance of dozers which were sent down into the holes opened up by the draglines. At the present time, the machines are working as cranes. One has a 70-ft. boom and is handling concrete work on substructures, columns and caps. The other 80-D has an 80-ft. boom and 15-ft. jib and bails concrete from transit mix trucks at ground level up to the bridge deck.

A Koehring 605 crane worked as a piledriver installing Monotubes under several bridge piers and in cofferdam work. It was equipped with a 60-ft. lead, a McKiernan-Terry 9B3 pilehammer and follower block for driving these pile shells. Steam was supplied by a Cleaver-Brooks boiler. For driving the interlocking sheet steel piling for cofferdams, the Koehring carried a 10B3 hammer. After completing pilework, the crane was assigned to concrete work.

Smaller cranes include a Northwest model 6 and two Lorain Moto-Cranes—one 20 and one 25-ton capacity. The cranes handle form erection, concreting, passing of lumber and steel to the deck level and other miscellaneous jobs.

Job Begun in 1957

The T-4A contract was awarded to the Cunningham-Kiewit-Paschen combine in May 1957. First concrete was poured on July 18 that year. Condon-Cunningham is providing the entire supervision and engineering personnel on the job.

A variety of problems was present for Condon-Cunningham's experienced bridge builders. Among the worst of these was the presence of high ground water. The area along the Des Plaines river was once swampland.

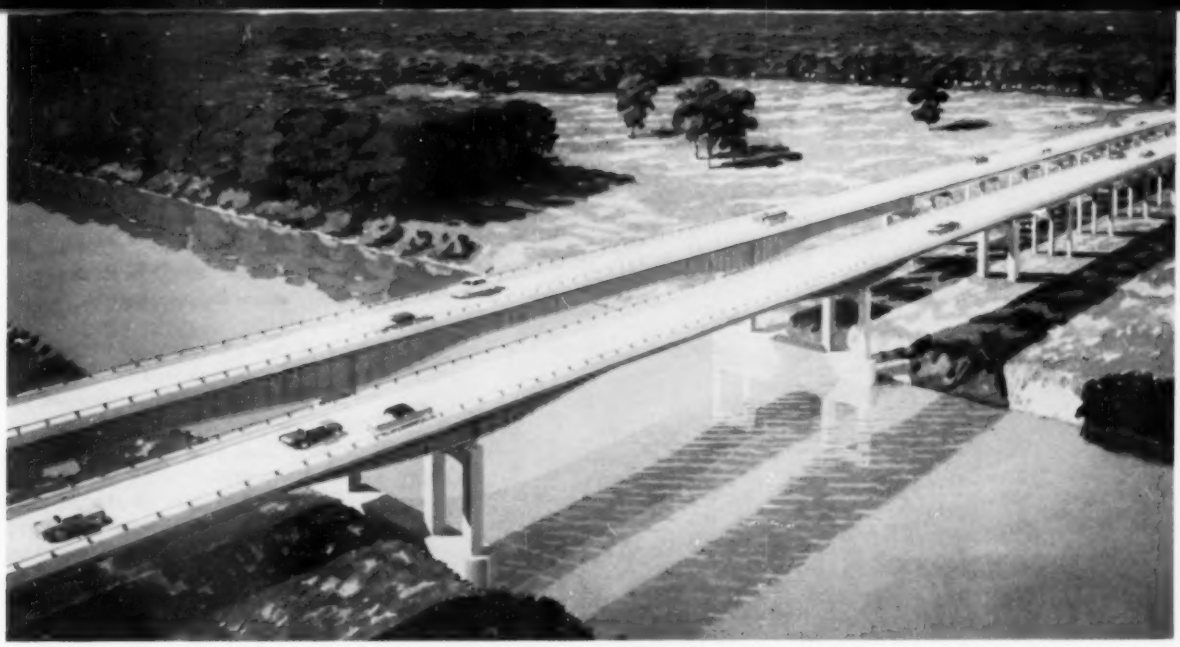
The situation was alleviated somewhat when Fisher Body Div. of General Motors built its nearby Willow Springs automotive body plant several years ago and installed a number of drainage sewers. These pipes took off much of the excess water, but not enough to prevent trouble for the excavation crews. A dozen Jaeger centrifugal pumps ranging from 2 to 8-in. diameter were kept in constant operation dewatering structural holes.

An unusual design feature of the job, at least as far as the Chicago area is concerned, is the foundation of bridge piers.

Most structures on the Illinois toll highway are founded on piles of one type or another driven into clay. However, on the T-4A job the log of test borings showed that the soil conditions were sufficiently firm to support spread-type footings; pilings were not needed except for several instances. The material along the job generally is a rather solidly packed gravel, mixed with numerous boulders, which provides good bearing ability. The spread footings are designed to carry a weight of 5,000 pounds per square foot.

All piers are founded on such footings, except on the north bank of the Ship Canal. There a group of piers are placed on Monotube piling. These tapered, fluted hollow pile shells have a 12-in. nominal diameter and are filled with concrete. Their design load is 50 tons per pile. They are a product of the

(Left) After footing is poured, reinforcing fabric for pier block is installed. (Right) Lorain MotoCrane places concrete in form.



Artists's rendering shows how roadway will look over the Chicago Sanitary and Ship Canal which is bridged by a steel span.

Union Metal Mfg. Co., Canton, Ohio.

The spread footings run consistently in size, requiring about 55 cubic yards of concrete. The deepest excavation at any point is about 15 feet below original ground level. Each hole measures approximately 60 feet long and 15 feet wide. At the stream crossing, where loads carried by piers are heavier, footings are larger. There are a total of 106 pier footings. Ninety-eight of these are spread type; eight are designed for tremie seals and seven for cast-in-place piling.

The pier holes had to be overexcavated because of ground water conditions. It was necessary to construct the ditches lower than the elevation of the bottom of the footing in order to drain and stabilize the subgrade for concrete placements. In addition, a relatively flat 1 on 1 ditch slope was required to prevent excessive stuffing.

As a result of these conditions, contractor crews dug three yards of material for every pay yard.

Two Caterpillar tractors—a D8 and D6—helped draglines dig the spread footings. Later they backfilled the holes after the concrete was poured. The D6 was sent down into some of the holes to perform the finegrading.

Cofferdam construction was required to install piers along banks of the Ship Canal. Interlocking sheet steel piling was driven to refusal about 36 feet below natural ground level. The presence of boulder obstructions in the ground hampered operation and ruined some of the sheet piles.

In driving the Monotubes, similar difficulty was encountered. However, the tapered design of the pile shell shunted the boulders aside more easily, so that no Monotubes were lost.

Pier blocks are cast in place on top of the spread footings on the piles. Each pier has three 36-in. diameter cylindrical columns capped by a 3½-ft. high, 4-ft. wide concrete member which is tied into the columns by steel bars. Both steel and wood forms are used for concreting. The dual two-lane bridges will have roadway decks 30-ft. wide. The reinforced concrete deck will be 7½ inches thick, except over the Ship Canal where it will be 8½ inches. Parapets are 16 inches high and 14 inches wide. Guard-walls are 10 inches high and 12 inches wide.

The bridge is built for a vertical clearance of 39.79 feet above the navigable Chicago Sanitary and Ship Canal. The roadway itself is 55 feet above water.

Because the Illinois state toll highway

Center section of Ship Canal span is raised by floating stiff-leg derrick. Bethlehem Steel Co. supplied and erected 3,163 tons of steel under a separate contract.

Operator James Campbell relaxes in cab of his air-controlled Bucyrus-Erie 71-B crane after completing a lift. Project Manager James Wilson standing on running boards of cab looks pleased with the day's progress during which 18 beams were erected.

commission expects traffic volume to increase greatly within the next few years, the toll authority is constructing many sections of the toll system that are now equipped with two lanes in each direction, with special built-in provisions for expanding to three lanes at a future date. The T-4A job is one of such sections.

The built-in provisions here consist of extra-wide footings and pier blocks. To produce the additional lane, the commission in the future will simply erect an additional column, extend the present capping over this column; set in place more concrete beams over the concrete cap; and pour the concrete deck on the beams.

In addition to the prestressed members primarily used, the bridge superstructure is a combination of simple roll beams, composite beams and built-up fishbelly plate girder beams. Structural steel is being used only on those portions of the bridge which require comparatively long continuous spans, such as across the Des Plaines River, the Ship Canal and some of the Railroad spans. In these cases steel is used rather than concrete because the 100-ft. mark apparently is about the breaking-even point where steel and concrete costs are parallel. For distances over 100 feet the steel members are cheaper.

All red iron is furnished and erected for the T-4A job by the Bethlehem Steel Co. under special contracts awarded by the toll commission. Cunningham-Kiewit-Paschen are building only the concrete substructures and superstructures for those spans using steel.

Use Floating Derrick

Bethlehem erected structural steel over the Ship Canal with a barge-mounted 180-ton stiff-leg derrick which the firm built especially for bridge work. Land spans were erected by crawler cranes. The steel was fabricated at a Bethlehem mill in Pennsylvania and shipped by rail. The heaviest single piece weighed 76 tons. Depth of the largest girder was about 12 feet at the pier connection. Total quantity of steel used on the job was 6,326,000 pounds.

Originally, all structures on the Illinois toll highway were planned for steel beams and girders, but steel prices were so much higher than for prestressed concrete and delivery dates were so far in the future that the job couldn't be finished as economically and as fast if the conventional designs were retained.

Precast concrete materials require only one-tenth as much steel as usual metal structural members. However, a bridge built entirely of steel would not take any more punishment than the present concrete components. In designing the toll highway bridges, engineers of the toll commission established the load limits each structure would be required to support. Then they worked the design around those limits, first using steel, and later changing to prestressed concrete.

About 219 bridges on the 187-mile toll system are built entirely of concrete and three additional structures of both concrete and steel. Forty-nine bridges will be all-steel.

The concrete bridges will cost approximately $4 million less than the original estimate for steel bridges, according to M. E. Bender, chief bridge engineer for Joseph K. Knoerle & Associates.

Subcontractors

Supply contracts for the miles of concrete beams required over the entire toll highway system were awarded to three Chicago firms. They are the Lewiston Pipe Div., American Marietta Corp.; Material Service Corp.; and Consumers Company Div., Union Chemical & Materials Co. The total precast requirements involve an estimated 406,300 linear feet (76.95 miles) of girders and beams.

Project Manager Wilson has been with the Condon-Cunningham firm for 12 years. Among the large road projects on which he has worked are the Indiana toll road where he was project manager for the firm's bridge division. On the Ohio turnpike, where the firm had about $5 million worth of bridges, Wilson was superintendent of the C-C bridge division. Among large bridge contracts he has superintended are the Bellevue (Neb.) bridge across the Missouri River and the Dunbar (W. Va.) bridge across the Kanawha River near Charleston.

Prior to his association with Condon-Cunningham, Wilson worked for Deering & Davidson, Inc., a St. Louis (Mo.) bridge contracting firm which went out of business during World War II.

Project Engineer Roswell Howard has worked under Wilson on both the Ohio turnpike work and the Bellevue bridge job. He has been with the firm since

Continued on page 54

Let's Talk Tracks

By Thomas C. Kingsley*
Service Department,
Caterpillar Tractor Co., Peoria, Ill.

When a tractor operates in mud, material packs around the rollers and builds up on top of the guards and around track carrier rollers causing rollers to "freeze". Once rotation stops, track links slide over the roller surface producing rapid wear.

IN economists' language, a track-type tractor is a capital good. In plain words this simply means that it's used to make money. No matter how a job is figured a good share of the profit depends on what it costs to keep machines operating. Nobody wants to replace track before it is absolutely necessary. So it's just good business to take care of track parts and rebuild them at the most economical time.

Modern track groups are the result of continuous research, design and improvement over a long span of years. Moreover, today's track may look like yesterday's but there's a world of difference in performance. To illustrate this fact, look over the jobs crawler tractors are doing today—ripping rock, dozing out huge stumps and push-loading giant scrapers. Only track that is as modern as today's job can stand up to these conditions. But track is no different than other parts of a machine. No matter how well it's built, proper care is essential to gain the best performance.

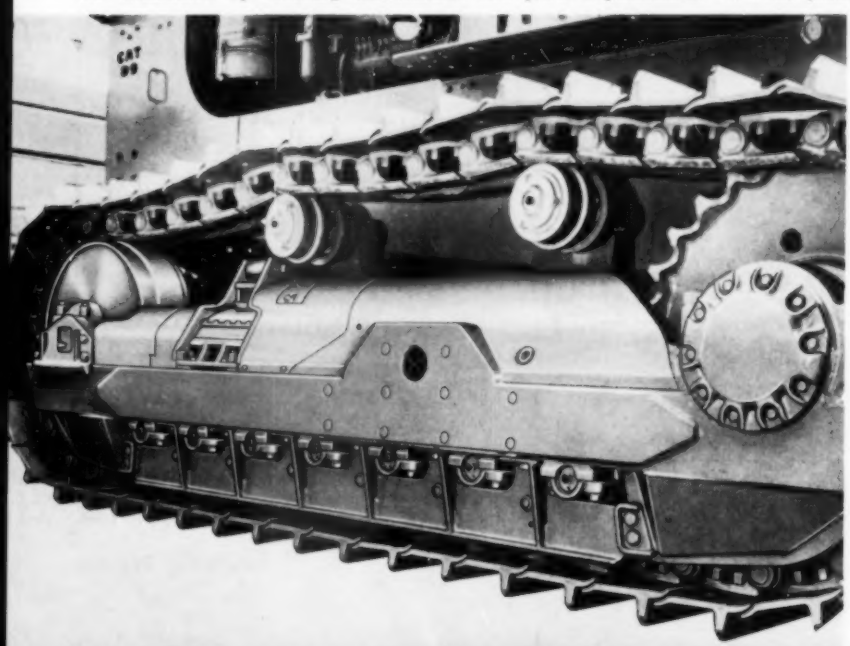
How long should track last? Of course, any answer to this question depends on a lot of things—the tractor itself, the job, soil conditions, maintenance and the operator. Economical track service life can be obtained by recognizing track problems and knowing what to do about them.

The first consideration of any discussion of track problems starts with the type of jobs a machine encounters. The manufacturer of the track-type tractor markets a basic machine with standard equipment for application under most job conditions. The marketing system does not burden any owner with the purchase of expensive, unwanted and unnecessary equipment. To obtain more economical service life under severe operating conditions, the manufacturer makes available a selection of attachments and special parts which will satisfy all but the most extraordinary conditions. The application determines which attachments are most economical and most needed.

A former service representative for Caterpillar in eastern states, Kingsley is currently a staff engineer responsible for analyzing field problems on track components.

The greatest single cost in the upkeep of a track-type tractor goes for repair and replacement of track. A service engineer tells how these costs can be kept down in a two-part article.

Track roller guards shown here are bolted to the track roller frame. Guards soon pay for themselves by reducing maintenance and parts replacements on rock jobs.



Rock Work Needs

For example, the use of a track-type tractor in rock work presents operating conditions and wear characteristics very different than those encountered in routine dirt work. Track shoes, rollers, idlers, links, pins, bushings, final drive sprockets, guards and even hardware wear longer in dirt operations than in

Modern track groups are designed to take the punishment of tough assignments like pushloading heavy scrapers and ripping rock.

rock. Tractors operating in rock must be equipped to combat increased depreciation if the owner expects to attain the longest possible service life and best value for his investment.

In this case, track shoes are the first parts to consider. Wide track shoes are the most satisfactory when flotation is needed for operating in mud, gumbo and some dirt work. Quite naturally, track shoes are more susceptible to breakage where rock is encountered. Wide track

Thomas C. Kingsley

shoes have greater overhang beyond the track chain than narrow shoes. Loads applied to the outer edge of the wide shoes create greater leverage. The result is that wide shoes are more frequently damaged while working in rock than are narrow shoes. There is another advantage of narrow shoes. When working in hard material, the narrow grouser will penetrate deeper, increasing traction.

For those operations where a tractor is called upon to work almost exclusively in rock, special heavy-duty track shoes should be used. These shoes may be of either double grouser or flat design depending upon the amount of traction needed. In especially abrasive rock a manganese alloy shoe may prove to be the most economical investment.

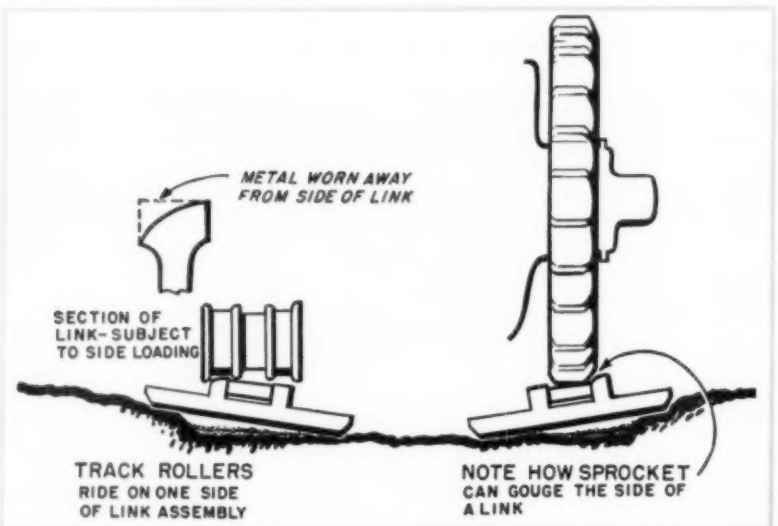
Roller Guards

When a track-type tractor is working in rock, don't overlook the advantages of track roller guards. From the standpoint of economy, these attachments will pay for themselves many times over. Field experience has proved that track roller guards effectively protect track parts and extend service life. These guards are designed to keep rocks from feeding in and being crushed between the track rollers and the track.

In addition to abrasive wear between the rollers and the track lines, rock which feeds into an unprotected track causes many other difficulties. The crushing impact causes breakage of links, roller flanges and other parts. Rock causes external wear on bushings, idler rims and sprocket teeth. The impact of the crushing action slashes the life of the track roller bushings. Rock can cause track to tighten excessively around the sprocket. Stretching out track causes the link pin and bushing bores to expand, resulting in loose pins and bushings.

Track roller guards help hold the track on the rollers on steep slopes. These attachments also help reduce wear on roller flanges and idler pilot rims. Rock guards are not unimportant gadgets; they are essential for economical operation over rough terrain.

Rock isn't the only condition requiring the use of alternate parts or


METAL WORN AWAY FROM SIDE OF LINK
SECTION OF LINK-SUBJECT TO SIDE LOADING
TRACK ROLLERS RIDE ON ONE SIDE OF LINK ASSEMBLY
NOTE HOW SPROCKET CAN GOUGE THE SIDE OF A LINK

Track shoes of large push tractors often extend outside the cut of older, unmatched scrapers as illustrated above. To avoid damage to track and final drives, narrow or inside offset shoes should be used that match the cut of the narrowest scraper used.

attachments. Snow, mud and wet sand have a tendency to "pack" in the track and cause severe strain on all track components. To prevent material from building up and clogging tracks, special snow shoes may be installed which have a cut-out section in the center of the shoes between the bolt holes, and snow sprockets which have deeper recesses between the teeth than standard sprockets.

The advent of large push tractors has also brought about the need for special track shoes. The width of the push tractor is usually wider than older makes of scrapers. The outer edge of the track shoe rides out of the scraper cut forcing the track in toward the tractor. This condition causes the sprockets to rub against the outside link as well as causing accelerated wear to roller and idler flanges. Where flotation is not a factor, narrow shoes offer the best solution to the problem. If flotation is required, when working in such materials as sand or mud, offset shoes should be used that match the cut of the narrowest scraper on the job.

Consider the selection of track equipment and attachment which are available for use in other than average conditions. The tractor which is equipped to meet the problems of the job will give the best performance.

Operator Habits

Once a tractor is equipped to accomplish a job in the most economical manner, the operation of the tractor should be considered. If an operator understands the importance of proper machine operating techniques, he can do much to lengthen track life.

Track rollers distribute the tractor's weight over a large area. Proper operating techniques let each roller carry its fair share of the load. Reckless, "cowboy" operation over rough, rocky ground or other obstacles slams the impact from one track roller to another. This is not only one of the quickest ways to shorten roller life (particularly that of the front roller), but it is also a fast way to reduce the life of the idler bearings and other track parts. The track-type tractor is a tough, rugged piece of machinery; but, why heap on abuse? After all, it proves nothing except a disregard for economy and downtime.

Another damaging practice is "spinning" track. This practice provides no more drawbar pull than a spinning rubber tire provides rim pull. But when the rubber is burned off a $3,000 tire,

Continued on page 55

MARION's *Aluminum* FRAMELESS DUMP TRAILER hauls 21 TONS LEGAL PAYLOAD

This 28 yard aluminum frameless dump trailer is shown stockpiling coal. It is equipped with F-714-T-156 front end hoist.

With each haul of 21 tons legal payload in Ohio, this aluminum frameless dump trailer is providing its owners EXTRA LARGE payload dividends.

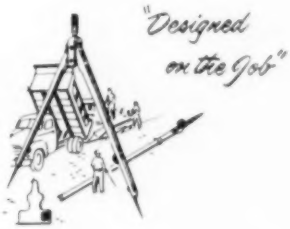
Satisfied owners J.C. Johnson and Fred Utz, Cross Creek Coal Co., New Philadelphia, Ohio say the unit averages 1½ to 2 tons more payload than their same size Marion frameless dump made of steel. Extra payloads of from 2 to 4 tons are realized over conventional type trailers.

In addition to the large payload advantage, main features that helped sell the Marion aluminum body are the extra heavy duty design, the extremely long life benefit and its complete resistance to corrosion thereby eliminating the need for periodic painting.

Other advantages mentioned about Marion's frameless type of construction are its maneuverability, fast dumping and easy accessibility to all moving parts for servicing.

The Cross Creek Coal Co. mines and processes 1000 tons of coal daily. Two Marion frameless units help haul the processed coal to various locations in Ohio. The company also owns two other Marion units that haul coal from the pits to the preparation plant.

See your Marion Distributor for all the profit-facts about Marion's frameless trailer units available in steel and aluminum for all types of hauling jobs.



MARION BODIES AND HOISTS

MARION METAL PRODUCTS CO.,
MARION, OHIO, U.S.A.

"This machine has the balance, stability and speed to outdo all other loaders in this size range"

That's how G. C. Collins of Collins Bros. Contracting Co., Memphis, Tenn., refers to the 1¾-yd. Model 12 "PAYLOADER" tractor-shovel.

Collins has been using tractor-shovels of various kinds in his excavating and grading business through the years, so he and his foreman and machine operators are tractor-shovel "veterans". They know what each model can do and how easy they can do it.

Collins' Foreman, Billy M. Garrett, has this to say about the Model 12: "I like the foot control of the speed when approaching trucks that leaves both hands free for other controls and no clutch to work". His operator, J. T. Parish, says, "In my 27 years as an operator, the Model 12 is the fastest machine I have ever worked and is very easy to control."

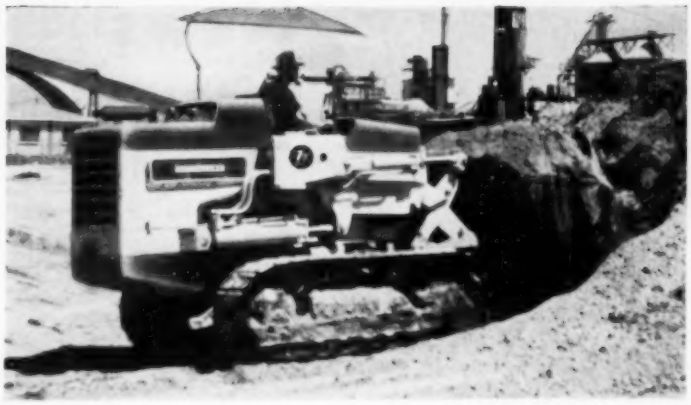
This refinery job, as an example, involved expanding and revamping the storage capacity. It was necessary to tear down existing dirt fire walls and throw up new ones . . . to dig foundations for new tanks . . . to load out several thousand yards of dirt. The Model 12 ate up all this work easier and faster than any tractor-shovel they ever owned, and it's the machine that all four of their operators prefer to run.

G. C. COLLINS

"Advance design of the Model 12 "PAYLOADER" gives unequaled operator comfort, handles more yardage at lower cost per yard."

"Does three times as much work"

Carl Johnson of Robert A. Whitaker Co., Manteca, California, says, "Now we've got speed. Our other loader was just as big, but we're getting 3 times as much work done with the Model 12. Take this job I'm on now. It's dusty and tiresome, but the Model 12 power-shift transmission and power-steering make it easy. More comfortable position for the operator, easy controls, good vision and knowing you are knocking out the work faster makes the Model 12 the best of its kind."



"Outproduces two other larger shovels"

That's the word of Bud Clary of Clary & Son, Dayton, Ohio, who explains, "The Model 12's maneuverability, balance, speed, and ease of operation enables my operators to load out more yardage per hour than larger tractor-shovel units. On an airport job this summer, excavating 10″ of broken concrete and 2 feet of earth, it loaded out up to 500 yards per 8 hours—considerably more than the two other tractor-shovels on the same job."

"Cuts basement excavating time by three hours"

John Beniger, Sheboygan, Wis. contractor continues, "It's that kind of production that puts money in the bank for me. I can also load a 10-yd. truck from stockpile in 1 minute. Best of all, I'm not all worn out at the end of the day."

"The Model 12 weight is spread out over the entire track length instead of being concentrated on the front. This allows me to work on soft, spongy ground where others can't. Less weight on the front idlers also means less strain on the entire track."

"Operating the Model 12 is a cinch. Power steering requires only a light touch on the steering levers, and there are no back-breaking foot levers to pump in the process. Any speed change up or down is made instantly, on-the-go, with only finger-tip effort. Forward and reverse shifting is just as easy."

"It's the most ruggedly built tractor-shovel I ever owned. In 1,000 hours of heavy work, maintenance and downtime has been practically zero. As far as I'm concerned, the Model 12 makes all other tractor-shovels obsolete."

Your nearby Hough Distributor has all the facts on the radical new design 1¾-yd. Model 12 "PAYLOADER", the *complete* tractor-shovel with improved balance, speed and control "built-in". Ask him about convenient Hough Purchase and Lease Plans, too. The Frank G. Hough Co., 708 Sunnyside Ave., Libertyville, Ill.

8-C-1

Modern Materials Handling Equipment

THE FRANK G. HOUGH CO.

708 Sunnyside Ave. Libertyville, Ill.

Subsidiary—International Harvester Company

"WHAT'S 'BONDED BUY'?"

When you make a "Bonded Buy" purchase from your Caterpillar Dealer on any used Cat-built machine, he gives you a Guarantee Bond of up to $10,000.

And you can be sure that the used equipment you buy is in the best possible condition at the lowest reasonable price.

"ANYBODY ELSE OFFER 'BONDED BUY'?"

No—just your Caterpillar Dealer.

"DOES HE OFFER ANY OTHER KIND OF PROTECTION ON USED EQUIPMENT?"

"Certified Buy." This covers any make machine and includes his written guarantee. And "Buy and Try"—which carries a written money-back agreement.

"WHAT DOES ALL THIS MEAN TO ME?"

That you can be *sure* of a *safe buy* when you buy used equipment from your Caterpillar Dealer. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BEST BUY IN NEW AND USED EQUIPMENT

News from the Field

Plan Mining Show

The 1958 Mining Show of the American Mining Congress will be held in San Francisco, Calif., September 22-25. The combined convention and machinery exposition is expected to draw thousands of mining men from all parts of the United States and from several foreign countries, including Canada and Mexico. Facilities of both the Civic Center Exhibit Hall and Civic Auditorium will be utilized.

Government officials, members of Congress and officials of mining and other industries will be invited to address the four-day convention, which is expected to consider the future outlook for the domestic mineral industries, public policies affecting the mining industry and operating practices aimed at increasing productive efficiency.

An exposition of mining machinery, equipment and supplies will be staged. More than 170 leading manufacturers have already contracted for some 110,000 square feet of space in the exhibit halls. Equipment displays will range from small items to insure miners' safety to stripping shovels, mammoth trucks, and a variety of mining machines that extract minerals from the earth and process them.

Show New Drill Plant

A new $12 million Bucyrus-Erie drill manufacturing plant at Richmond, Ind., was shown to the public at an open house in June. More than 10,000 persons from Richmond and vicinity toured the eight-acre plant.

The plant is headquarters for the entire Drill Division of Bucyrus-Erie, whose main office is in South Milwaukee, Wis. Ground was broken in April 1957. Preliminary manufacturing operations began in February. Richmond will produce Bucyrus-Erie's complete line of water well, oil well and blast hole drills for both domestic and foreign markets.

One of the drill models displayed at the open house was the 50-R rotary, which two weeks before became the first drill produced by the Richmond plant. The 50-R drills blast holes up to 12¼ inches in diameter.

The plant has 348,500 square feet—312,000 in the factory and 36,500 in the offices. Machine tools and material handling equipment are new and of advanced design.

Henry Jameson is general manager of the Drill Division.

Blast Opens Navigation

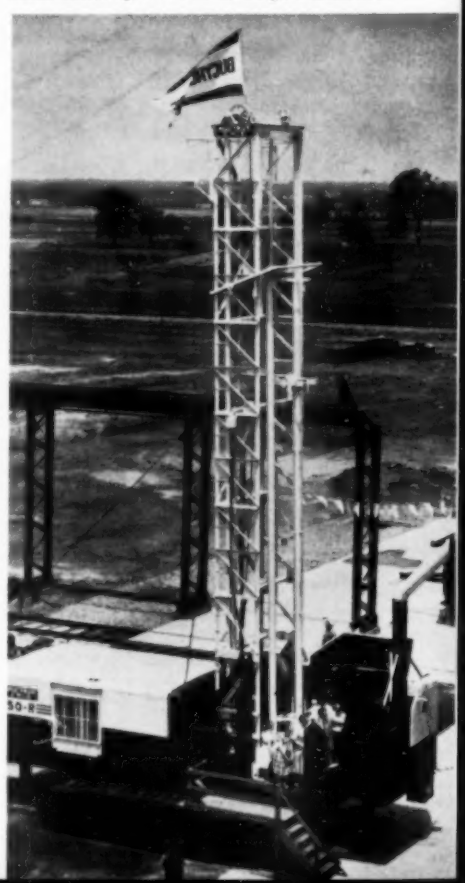
The American portion of the St. Lawrence Seaway has opened to 14-ft. navigation.

Passage of ships took place, for the first time in July through the 10-mile long Wiley-Dondero Ship Channel and its Dwight D. Eisenhower and Bertrand H. Snell locks. The long-waited event was made possible by the raising of the St. Lawrence power pool.

On July 1, the Ontario Hydro Electric Power Commission exploded 30 tons of ammonium nitrate explosives to blast

Continued on page 36

First drill produced at Bucyrus-Erie's new Richmond (Ind.) drill manufacturing plant is this 50-R rotary which drills blast holes up to 12¼-in. large diameter.



LONGER, MORE PROFITABLE ROLLER LIFE—THE RESULT OF CONTINUOUS IMPROVEMENT OF CATERPILLAR PARTS

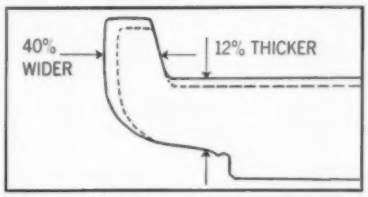
Cat "500" Track Rollers for D8s now have increased rim size for greater strength

A ceaseless search for ways to improve parts performance goes on at Caterpillar. Engineers are constantly striving to make each machine part do its job better, longer and more economically. The payoff for the customer is the steadily improving performance of Cat machines on the job.

New "500" Track Rollers for Cat D8 Tractors, for example, have been redesigned to better resist wear and breakage on the tough jobs. The roller rim has been thickened 12% in its critical area; the flange is 40% wider. The new design prevents roll-over and bending of the outer flange under severe side hill loads.

All Cat roller rims are designed so that treads and flanges may be economically rebuilt by automatic welding—a feature which results in big savings over the life of a tractor.

But that's only part of the story. Matchless Caterpillar quality starts with selection of steel. Extensive testing in Caterpillar metallurgical laboratories eliminates all but the finest quality steel *before* roller manufacturing begins. Further tests (61 in all) are made at every stage of production.



ADDITIONAL MATERIAL on new D8 roller rim is shown by dotted line, above. Thicker, stronger flanges give greater wear resistance and a longer productive life.

Cat roller rims are made from forgings to insure maximum strength and uniformity. They are bored and given a controlled heat treatment producing thick, file-hard wear surfaces; the remainder is left tough to resist shock damage.

These rims are shrunk onto cast-iron hubs of high compressive strength and then center welded. This prevents bore distortion and separation. Automatic precision machines finish-bore the roller assemblies. Careful inspection guarantees uniform quality.

Similar Caterpillar quality is built into track roller bearings and shafts, too. A special bronze alloy is used in Cat bearings to support extra-heavy loads. A cast-iron bushing with high compressive strength encloses the bearing.

There is only one way to get maximum production—the production you paid for—from your equipment. Keep your big, yellow machines on the job by using only constantly improved genuine Cat parts. Your Caterpillar Dealer has full information about the new Cat "500" Track Rollers and all the other quality Caterpillar parts. See him today.

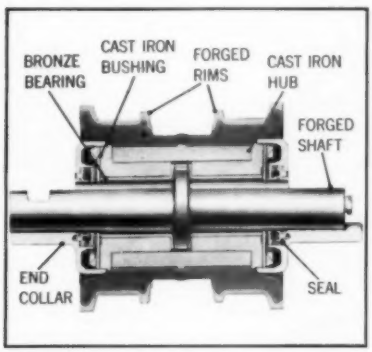
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

SERVICE TIP

Ask your Caterpillar Dealer about the additional economies provided by 500-hour lubrication periods.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.



ROLLER CROSS SECTION of Cat "500" Track Roller shows rugged construction. Roller shafts are forged for controlled grain structure, maximum toughness and to permit superior heat treatment. Wear surfaces are hardened to a depth of at least 3/32", leaving a tough, strong core.

TOUGH JOBS, like the one pictured above, play havoc with any but the best track rollers. Here's what happened on an actual job: New Cat rollers were installed on the right side of a tractor; another brand of rollers on the left side. After 668 work hours, seals and bearings of two of the other brand rollers failed. They broke up and were lost from the roller shell. The Cat rollers showed normal wear and the 500-hour lubrication proved its value. Owners everywhere are proving that it pays to standardize on Caterpillar—equipment *and* parts.

FOR 50 YEARS...
Finest in the Field!
Rely on the bucket contractors rely on. The Omaha Dragline Bucket gives full load with every cast. Perfect balance makes it easy to spot dump. Alloy steel cutting teeth stay sharp, tough and ready. Strike pay dirt now! Complete information and specifications await your letter.
DRAKE-WILLIAMS MOUNT
• OMAHA, NEBR.
OMAHA
DRAGLINE BUCKETS

News . . .

Continued from page 34

away a 600-ft. wide earth and rock cofferdam which held back the north channel of the St. Lawrence River from the international project's huge power dam and generating station. The shot was the largest of the entire Seaway and power projects.

Water pouring through the blasted plug slowly flooded 38,000 acres of valley land, creating a new lake 28 miles long, 5 miles wide and 100 feet deep.

The new lake as yet has no name. Unofficially, it is known as Lake St. Lawrence. Many officials of the project simply refer to it as the "head pond."

The lake has two purposes: 1) to feed the St. Lawrence powerhouse's 32 turbine-generators with a 90-ft. head of water; and 2) to provide deep water navigation.

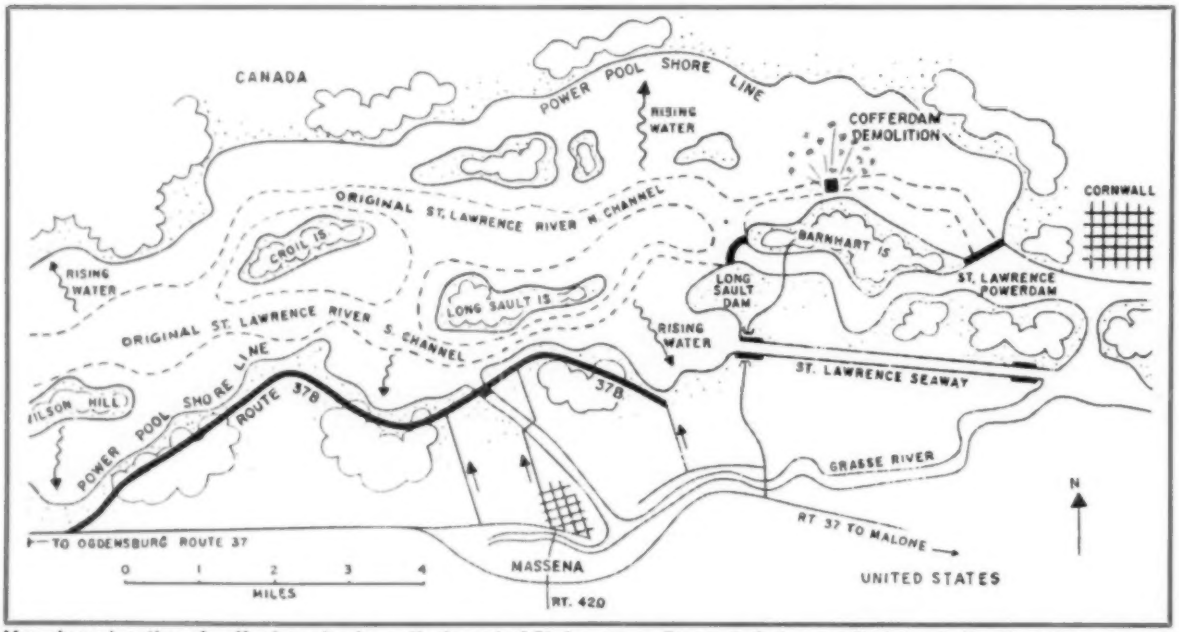
Level of the lake rose sufficiently within three days to permit navigation through the two giant locks on the American side of the project. Each of these locks is 860 feet long and 80 feet wide, with a depth of 30 feet over the sills.

The U. S. Coast Guard cutter *Maple*, stationed at Ogdensburg, N. Y., made the initial transit through the locks on July 4, earning the distinction of being the first vessel to navigate the $130 million American Seaway facilities. Scores of other vessels of American, Canadian and foreign registry followed.

Installations on the American side of the St. Lawrence are being built by the St. Lawrence Seaway Development Corp. Facilities are better than 85% complete for 14-ft. navigation and will be fully completed for 27-ft. navigation by April 1959.

Device Protects Crane Operators

A patented safety device called the "Saf-T-Boom" promises to eliminate one of the construction industry's major



Map shows location of cofferdam plug in north channel of St. Lawrence. Removal of plug was first step in flooding of power pool.

IMMEDIATELY RECOGNIZED

VALUE

TVT

in the ROGERS Top Value Trailer

brought requests for larger similar units

We Responded and Now Offer a

35 Ton Capacity TVT TRAILER

with all the features of the 25 Ton unit — lightness with strength — ease of loading and hauling and other desirable features — at a new low price.

Choose the 25 Ton or 35 Ton TVT with level deck as illustrated above or drop deck to provide greater headroom clearance for high loads.

TREMENDOUS VERSATILTY TOO IS FEATURED IN THIS ROGERS TRAILER

Get Complete Information — Be Surprised And Pleased At The Advanced Construction And Low Cost.

ROGERS LOW BED—HEAVY DUTY TRAILERS

ROGERS BROS. CORP. ALBION, PENNA.

Export Office: 50 CHURCH ST., NEW YORK 7, N. Y., U. S. A. *Cable Address* "Broscites"

hazards—the problem of using tall crane and dragline booms around high voltage power lines.

During a recent demonstration the insulators on a "Saf-T-Boom" installation withstood 36,000 volts for five minutes without any evidence of current leakage into the boom of a standard crane.

In another test at the Arkansas Foundry Co., Little Rock, Ark., a standard crane fitted with the device was placed in contact with a 440-volt electric line without danger to the operator or ground personnel.

The device was invented by Art Thomas of Little Rock—a safety director for various companies throughout the nation. Among awards Thomas has received is one for more than three million man hours without accidents at the Grinnell Corp., Portsmouth, Ohio.

The "Saf-T-Boom" is manufactured of ¾-in. steel tubing and is equipped with four General Electric 15,000-volt insulators capable of withstanding a 5,000-lb. drop test. The device is described as a dielectric guard. Installation time required is about 10 minutes. The guard weighs about 250 pounds.

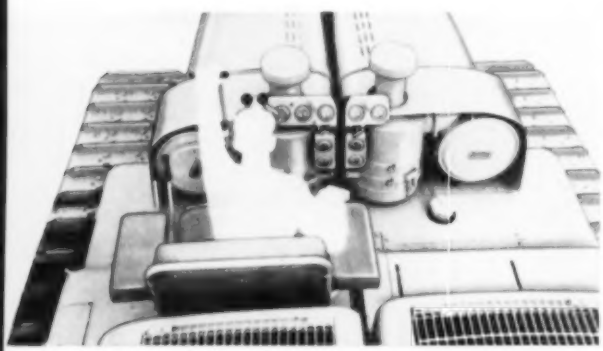
The device will be manufactured by the Arkansas Foundry Co. and marketed by Saf-T-Boom, Inc., a new company quartered at 309 Center St., Little Rock.

Clarence Thornbrough, Arkansas state labor commissioner, examines crane boom insulated with the new dielectric guard.

Tremendous power, quick maneuvering and on-the-go power shift cut valuable seconds from cycle times when the TC-12 is used for push-loading scrapers.

As a dozer, this Twin-powered Crawler provides unmatched work-ability because of its ease of handling, smooth push power and brute strength.

For heavy ripping work, you can count on unequalled drawbar pull and plenty of stability to do a really fast and thorough job.



With convenient, simplified controls, the TC-12 has no equal for operating ease—by keeping operator fatigue to a minimum, full shift efficiency can be maintained.

New Series EUCLID

Ever since the TC-12 was introduced, there has been no question about its top performance ability —even on the toughest crawler jobs. Now with over 3 years of field experience on practically every kind of operation, major product improvements make the new TC-12 better than ever.

Powered by two engines, there's a total of 402 net horsepower delivered to the power train through separate Torqmatic Drives for each track. Big 27″ shoes and 8 rollers give the TC-12 good balance with or without heavy duty dozer blades and other mounted equipment. Bare weight of the tractor has been increased to 67,000 lbs. as a result of heavier construction and more rugged components throughout.

With independent track drives, there's no dead track drag when turning—maneuverability of the big TC-12 with its full power shift saves seconds on every cycle whether you're push loading scrapers, dozing or pulling big equipment. And with unitized assembly, good design of component location and equipment mountings, this "Euc" crawler provides easy accessibility for service and maintenance.

Have your Euclid dealer give you all the facts on the new TC-12 . . . you'll find it's your best buy by far where big tractor performance is needed.

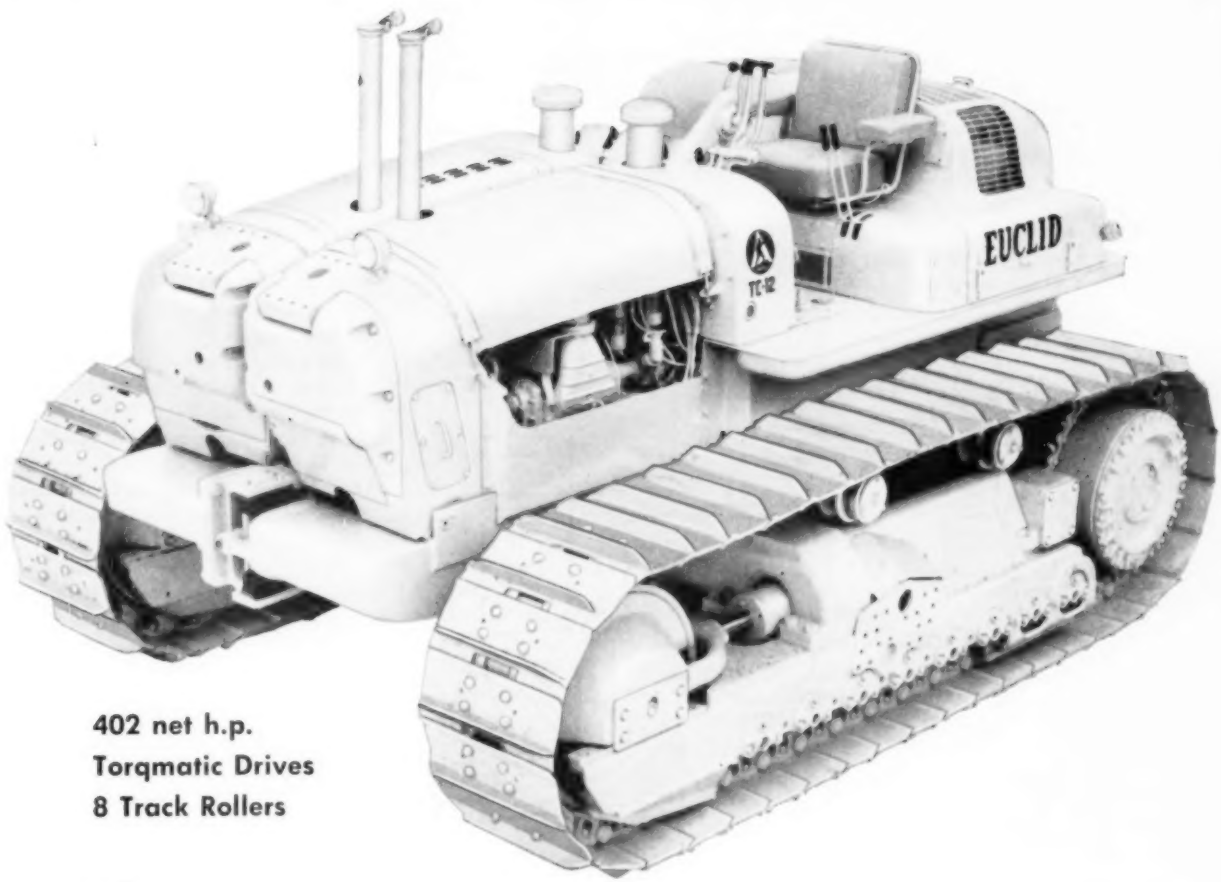
EUCLID DIVISION of GENERAL MOTORS, CLEVELAND 17, OHIO

TC-12 ...now even further ahead of other crawlers

in maneuverability . . . service accessibility . . .

in functional design . . .

and in work-ability



402 net h.p.
Torqmatic Drives
8 Track Rollers

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Equipment You Ought to Know About

Scraper Cutting Edge

Manufacturer: Electric Steel Foundry Co., Department EE, 2141 N. W. 25th Ave., Portland 10, Ore.

Claims: A new tooth-type scraper blade has been developed by Esco. Field reports reveal that the new cutting edge performs exceptionally well in rock shale, limestone, hardpack clay, sandstone and other tight formations.

Working in limestone and shale, a 15½-yd. scraper equipped with the Esco tooth-type cutting edge loaded in 45 seconds while a conventional blade loaded in one minute and 30 seconds. The tooth-type cutting edge loaded hard packed clay in one minute compared to a loading time of one minute 50 seconds with a conventional cutting

edge. Twenty-five additional loads were gained in a 24-hour period with one tooth-type blade on one scraper.

A conventional cutting edge, aided by rippers attached to the pushcat, loaded rock and shale in 30 seconds. A scraper equipped with the tooth-type blade reduced the loading time to 20 seconds and eliminated the use of rippers.

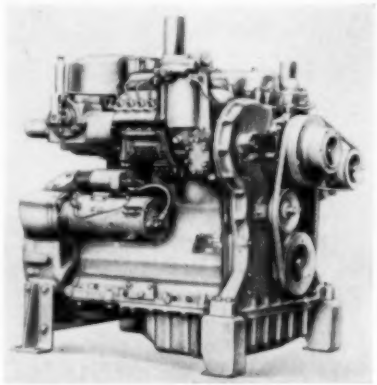
4-Cylinder Diesel Engine

Manufacturer: Caterpillar Tractor Co., Department EE, Peoria, Ill.

Claims: A new 4-cylinder diesel engine has been announced by Caterpillar. It is designated the model D311 (Series H). The heavy-duty unit has a 4-in. bore and a 5-in. stroke. It is a naturally aspirated, valve-in-head model and employs the same precombustion chamber type design used on all Cat diesel engines.

The 252-cu. in. displacement engine develops 75 hp at 2,400 rpm. It has an intermittent output rating of 68 hp and a continuous rating of 50 hp at 2,000 rpm. The generator for use with this engine has a 30-KW continuous rating and is completely self-regulated. A turbocharger which will soon be available will considerably increase all the above ratings.

This engine is another in Caterpillar's trend to produce new, more powerful models with smaller dimensions than the engines they replace in Caterpillar's line of diesels. In replacing the Cat D311 model, the D311 (Series H) maximum output capacity has increased 10 hp or more than 15%. Size has been so reduced that it is 9 inches shorter, 17 inches lower and weighs 350 pounds less than the D311.



Other features of this unit include harmonic balancers which provide six-cylinder smooth performance with a four-cylinder engine. A Lanchester type balancer reduces the objectionable vibrations which normally accompany 4-cylinder engines.

The fuel system is of the same general design as that which has been used on Cat engines since 1931. It employs the use of capsule-type fuel injection valves and pumps which are completely free from all field adjustments. No delicate checks or adjustments are necessary for proper operation.

To provide the type of starting best suited to any application, Caterpillar offers three methods for starting the D311 (Series H). Air or electric is available for automatic starting or for applications where speed, safety and convenience are required. For all-weather starting, most owners prefer the dependable gasoline starting engine. The D311 (Series H) has a new gasoline engine that is side-mounted instead of end-mounted as on the old D311. This provides a shorter installation.

A complete line of attachments will be provided including radiators, heat exchangers, clutches, torque converters,

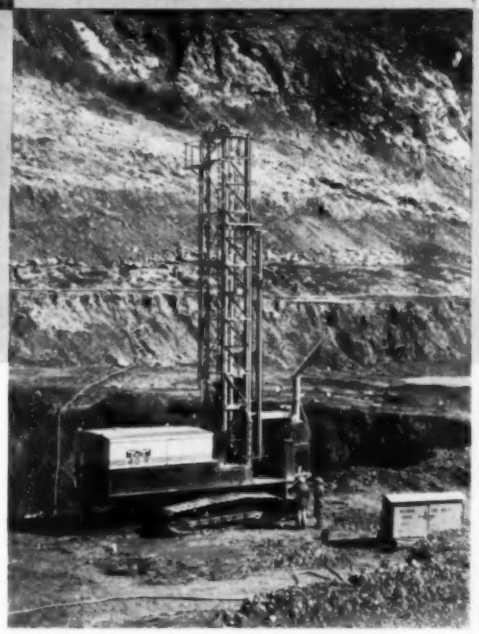
Continued on page 44

"Hank, let's make a ham sandwich."

in Canada . . .

This 40-R drills 7⅞-in. holes at an iron mine in south-central Canada. When moved to this location, it cut drilling costs per foot of hole by more than 50%. One of the features that contributes to the 40-R's fine performance is air bailing of cuttings. Compressed air cools the bit and cleans out cuttings, without need for water. Heavies pile up adjacent to the hole . . . provide handy stemming material.

At a western iron mine the 50-R shown here drilling 9⅞-in. holes put down over three times as much footage per shift as each of the four cable tool drills it replaced. One of the many reasons for this good rate is that the 50-R drills continuously for the full length of the drill pipe — 32 ft. 9 in.



Before any ore can be taken from copper deposits in one Peruvian location, overburden consisting of an entire mountain top must be removed. The 50-R shown here is one of seven chosen to do the job. Variable drilling speed and variable pulldown pressure provide the resources for speedy drilling at this mine. The exclusive combination of features permits the operator to obtain maximum penetration in any formation.

In the United States . . .

and in South America . . .

Bucyrus-Eries Set New Drilling Pace

Mine owners everywhere are experiencing new footage standards with Bucyrus-Erie rotary blast hole drills. Bucyrus-Erie rotaries assure continuous progress in any material by an exclusive combination of features: *variable drilling speed* through electric power with Ward Leonard control and *variable down pressure* through hydraulic motor control.

Look over the capsule stories with the drills pictured here. See how these important features helped Bucyrus-Erie rotary users put down hole fast. Then contact us for full information.

Ask about the full-electric 50-R for drilling 9⅞ to 12¼-in. holes or the 40-R with either full-electric or diesel-electric power for drilling 6¾ to 9-in. holes.

7685IC

A Familiar Sign . . . BUCYRUS ERIE *. . . at Scenes of Progress*

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

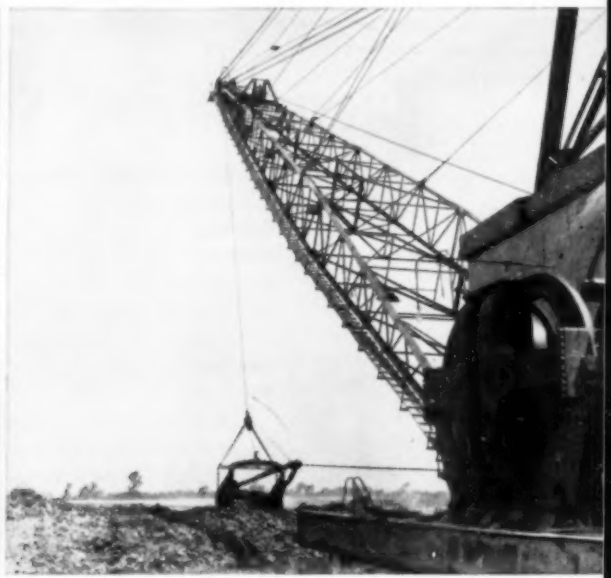
1 **MR. WIRE ROPE**—Ed Carey (right), Tiger Brand Wire Rope sales representative, is known as "Mr. Wire Rope" on the St. Lawrence Seaway & Power Projects. Ed is checking sheave grooves on a walking dragline with Mr. Mel Poeschl, Equipment Superintendent for Waddington Constructors, combine composed of Kiewit, Morrison-Knudsen.

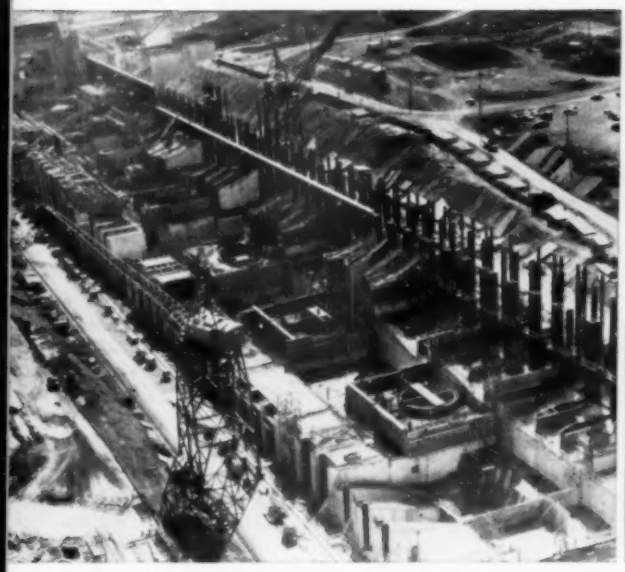
2 **GRASSE RIVER LOCK**, St. Lawrence Seaway. Gantry cranes rigged with 7/8" 6x19 Tiger Brand Hoist Ropes are pouring a total of 376,000 cu. yds. of concrete. This lock is one of two which will provide for raising and lowering vessels to and from the lake created by the Barnhart power dam and the Long Sault spillway dam. General Contractors: Joint venture between Perini, Walsh, Kiewit, Morrison-Knudsen and Utah.

Tiger Brand Wire Rope makes things hum

5 **IROQUOIS DAM**, New York State Power Project. Located 25 miles upstream from Long Sault Dam. This dam is to control and regulate the outflow from Lake Ontario. Cranes are equipped with 1 1/8" 18x7 Tiger Brand Non-rotating Hoist Rope. General Contractors: Joint venture between Kiewit, Johnson, Johnson.

6 **LONG SAULT CANAL**, mainland portion, St. Lawrence Seaway. Monighan dragline with 13-cu.-yd. bucket equipped throughout with Tiger Brand Wire Rope. The drag rope is 2 1/4" 6x19 Excellay Monitor Lang Lay IWRC. This job involves digging 12,000,000 cu. yds. of heavy marine clay and cemented glacial till, two of the most tricky and unpredictable materials you can find. General Contractors: Joint venture between Kiewit, Morrison-Knudsen.

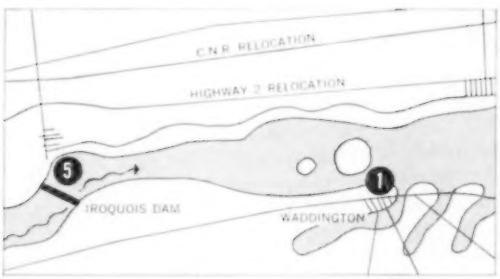


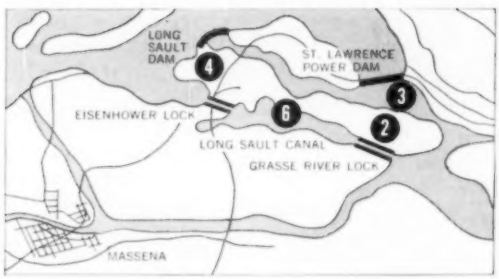


3 **ST. LAWRENCE POWER DAM,** New York State Power Project. Photo shows U. S. Section. Combined Canadian and American power houses will produce 1,880,000 kilowatts, half to each nation. Whirly cranes erecting forms and pouring concrete are rigged with Tiger Brand 7/8" 6x19 Hoist Rope Excellay Monitor IWRC. General Contractors: Joint venture between Perini, Walsh, Morrison-Knudsen, Kiewit, Utah.

4 **LONG SAULT SPILLWAY DAM, FIRST SECTION,** New York State Power Project. This dam controls the flow of water into the power pool and thence to the power dam. At present all of the St. Lawrence flows through this section. General Contractors: Joint venture between Walsh, Perini, Morrison-Knudsen, Kiewit, Utah.

on St. Lawrence Seaway and Power Projects





This is the big year on the St. Lawrence Seaway and Power Projects. Contractors are rushing to complete their jobs on time. Everywhere you look, big shovels and draglines are digging 24 hours a day. Huge gantry cranes are setting forms and pouring concrete. The St. Lawrence River has been moved so many times it doesn't know its own bed.

All this adds up to a situation that demands the most from machines and wire rope . . . and most of the wire rope on the American jobs is Tiger Brand.

Contractors wanted quality wire rope in a hurry. So, American Steel & Wire set up a warehouse in nearby Massena. They staffed it with competent men who brought in a complete stock of Tiger Brand Wire Rope in all types and sizes. Thus, the best rope obtainable could be delivered to the job sites in a matter of hours. The illustrations show a few of the locations where Tiger Brand Wire Rope is hard at work. American Steel & Wire, Rockefeller Building, Cleveland 13, Ohio.

USS and Tiger Brand are trademarks

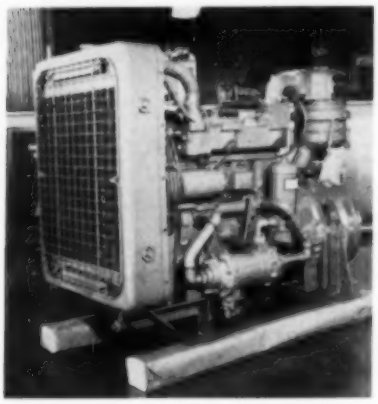
American Steel & Wire Division of USS **United States Steel**

Columbia-Geneva Steel Division, San Francisco, Pacific Coast Distributors • Tennessee Coal & Iron Division, Fairfield, Ala., Southern Distributors • United States Steel Export Company, Distributors Abroad

New Equipment . . .

Continued from page 40

generators, marine gears, power take-offs and many others. Parts and service will be handled by the nearly 900 Caterpillar dealer stores.



Shown above is a D311 (Series H) model equipped with electric starting, radiator, torque converter, clutch and glow plug starting aids. It is ready for installation in a ½-yd. excavator. Overall dimensions are: length 441 inches; width 27¼ inches; and height (excluding exhaust stack) 36 inches. Dry weight is 1,216 pounds.

Dual Purpose Compactor

Manufacturer: Seaman-Gunnison Corp., Department EE, 2763 S. 27th St., Milwaukee 15, Wis.

Claims: Ballast can be lightened or completely emptied in seconds in a new model Duo-Pactor. A dump-type ballast box, which eliminates need for removal of ballast by clamshell or hand shoveling, also allows the unit to serve as an 8 to 12-cu. yd. off-highway hauler.

The new unit will carry 32,000 to 40,000 pounds of ballast or payload, compared with weight of 18,000 pounds when empty. A hydraulic lift raises the body for dumping.

As a compactor, the Duo-Pactor's rubber rolls are used to make the first pass or two. The steel roll can then be lowered to a level even with the bottoms of the ruts formed by the tires. High unit pressure from the steel roll forces the ridged material down between the tire ruts to produce uniform compaction the width of the Duo-Pactor. Compaction tires for up to 125-psi inflation pressure are available for the Duo-Pactor.

As a hauler, despite its 50,000 pounds of loaded weight, the Duo-Pactor will not damage haul roads or soft fills, because the load is distributed evenly over eight rear wheels. It can be used to transport such materials as fill, sand, gravel, cement, and mixed base materials from a central mix plant. It is powered by a heavy-duty, 88-hp International tractor, modified as a two-wheel prime mover.

52-Hp Steam Generator

Manufacturer: Bros, Inc., Road Machinery Div., Department EE, 1057 10th Ave. S.E., Minneapolis 14, Minn.

Claims: A new 52-hp portable steam generator has been introduced by Bros, Inc. The new model SG-52, is an all-purpose machine with two-pass down draft design and a modified scotch marine type boiler.

Using the exclusive Bros two-pass design, the SG-52 achieves normal operating pressures in just 20 minutes from a cold start. It releases heat fast and evenly, minimizing stresses to the boiler structure that occur from uneven heating. All Bros steam generators have a safety margin of design pressure over and above standard operating pressure. Model SG-52 is designed for 163 psi and operates at 150 psi. Bros also employs a unique steam generator for hotter, dryer steam. Model SG-52 has a heating capacity of from one to three 10,000-gallon tank cars.

In addition to the new model, Bros also makes 30 and 60-hp generators. All models are available on either skid mounts or on semi-trailers and with manual or fully automatic operation.

"I could've swore I put that dynamite fuse line down here . . ."

Self-Propelled Scraper

Manufacturer: Wooldridge Div., Department EE, Continental Copper & Steel Industries Inc., Sunnyvale, Calif.

Claims: The Continental-Wooldridge scraper model CW 215 is a high speed self-propelled unit with a struck capacity of 15 cubic yards (21 yards heaped). It can haul 21-ton payloads at speeds in excess of 31 mph.

Powered by a 240-hp Cummins diesel engine and equipped with a 10-speed forward and two-speed reverse transmission, the CW 215 incorporates Roto-gear positive steering. Wooldridge says the Roto-gear equipment is one of the safest, trouble-free hydraulic steering systems in use on heavy-duty earth-movers.

Fast loading in all types of materials is accomplished by boiling-bowl loading, adjustable angle cutting edge and long profile bowl design. The air-operated power control unit is "live" at all times, providing the operator with instant power and immediate response while underway.

A feature of the CW 215 is its interchangeability with the CWD 214, 25-ton rear dumper, which permits use of the same tractor for either unit.

Short Length Truck Tractor

Manufacturer: Mack Trucks, Inc., Department EE, Plainfield, N. J.

Claims: Mack has placed in production what it describes as "the shortest conventional heavy-duty tractor cab arrangement ever developed in America." The tractor measures only 89 inches from front of bumper to back of cab.

The shorter dimension is designed to permit the use of longer trailers with larger payload capacity without exceeding the overall length limits prescribed for tractor semi-trailer combinations.

The new reduced length model is a full 13 inches shorter than Mack's standard conventional arrangement.

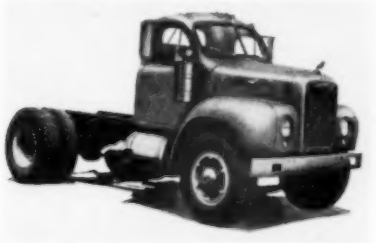
The shorter length will be available in two tractor models—the B-66 and the B-67—powered with Thermodyne gasoline and diesel engines respectively.

The reduced length was accomplished by moving the B model contour cab forward and allowing the engine to pro-

ject slightly into the cab. A small fiberglass cover is fitted over the portion of the engine protruding under the cowl.

Unlike other constructions of this kind, removal of the fiberglass cover and three small dash sections enables complete and easy access to the rear portion of the engine. This permits major overhaul without the necessity of removing the engine or cab from the chassis.

More than normal space for the driver is achieved by tilting the engine slightly to the right, and by provision of a new, more comfortable seat.



This shorter dimension of the new tractor, in addition to permitting use of longer trailers, also allows loading an extra 300 to 400 pounds on the front axle of the tractor.

The 89-in. dimension, bumper to back of cab, will permit the use of 35-ft. square cornered semi-trailers in states having a 45-ft. over-all length limit, or 40-ft. semi-trailers in states allowing a 50-ft. over-all length limit.

The new models also feature a new fresh air heating and ventilating system with the outlet facing directly toward the driver's feet and legs where the warm or cool air is most needed.

In addition to offering a choice of Thermodyne gasoline or diesel engines (the latter either naturally aspirated or turbocharged), the new models also are available with a broad selection of Mack-built transmissions, front and rear axles, brakes and optional power steering. They are also available in a weight-reduced version.

Portable Transmitter-Receiver

Manufacturer: Communication Products Div., Department EE, General Electric Co., Syracuse, N. Y.

Claims: General Electric has entered the hand-carried two-way radio market with a portable transmitter-receiver described as a new breakthrough in the technology of transistorization.

The new product features the first American tubeless receiver for use in VHF mobile communications services

Continued on page 48

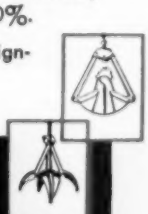
BIGGER PAY LOADS

with aluminum OWEN buckets

The combination of alloy aluminum plate with steel in the bowl construction of material handling buckets . . . 2½ cubic yards and over, eliminates up to 1000 pounds of dead weight. This affords a like amount of increase in pay load when rehandling comparatively light, free-flowing materials.

The exclusive feature of the closing line lead in the center plane of the bucket eliminates sharp bends at the guide sheaves and rollers, thereby increasing the life of the closing cable from 75% to 100%.

Long, internal main-shaft bearings insure permanent jaw alignment with minimum wear. Write for further details.



The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES: New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

CATERPILLAR

BUILDING THE WORLD'S MOST PRECISELY ENGINEERED HIGHWAYS

A fleet of CAT-built machines worked to exacting standards constructing loops for the AASHO Road Test. Grading operations alone required 114 engineers and technicians, 50,000 tests.

Caterpillar DW21s and DW20s with Scrapers helped move 1¼ million cu. yd. of earth in 3 months. At peak, more than 25,000 cu. yd. were moved daily. About half of this was placed in the upper three feet of embankment under strict controls for uniformity.

Caterpillar D8 Tractors pulled pneumatic rollers for precisely measured compaction. Gross weight of the unit is 15 tons; weight per square inch of tire—425 pounds. Seven to eight passes were required to provide the density demanded.

In La Salle County, Ill., six highway test loops make up what is probably the most rigidly engineered and supervised highway construction job in history.

It had to be. For these roads are the site of the largest, most comprehensive highway research project ever undertaken. Known as the AASHO Road Test, its prime objective is "to study the behavior of pavements of known thickness under dynamic loads of known magnitude and frequency."

Results of the $22 million test will be reported to Congress and probably will affect highway design and construction for years to come.

As is standard on any exacting, important highway construction job, Cat DW21 and DW20 wheel Tractors, D8 track-type Tractors and No. 12 Motor Graders were put to work by S. J. Groves and Sons Co. and Arcole-Midwest Corp. These machines, with their high availability record and minimum maintenance requirements, helped move 1¼ million cu. yd. of earth in 3 months under controls more strict than ever before attempted in large-scale highway construction. Grading operations were completed for four main loops of 6,600 feet each of four-lane divided roadway, a 4,400-foot loop, and a 2,200-foot loop. Total distance around each of the main loops is 3.1 miles.

For test traffic, trucks with axle loads ranging from 2,000 pounds on a single axle to 48,000 pounds on a tandem axle are scheduled to run 18 hours a day, six days a week, for two years over the five largest loops.

As the big yellow machines rolled on the job, thousands of tests were conducted continuously to assure precise uniformity of the earth in embankments. Compacted density was controlled between 95 and 100 per cent of standard maximum, and moisture content was controlled between plus or minus 2 per cent of optimum. During grading operations, 50,000 tests were performed and 114 engineers and technicians were at work both in construction control and in the materials laboratory.

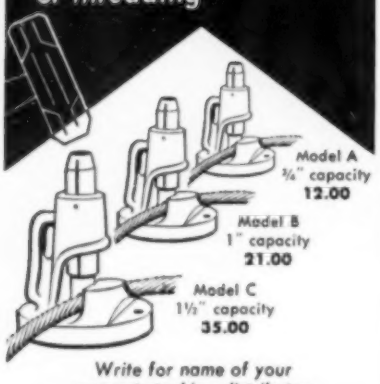
As is usual in jobs where there is no margin for error, Caterpillar-built machines were at work.

No. 12 Motor Graders, workhorses of highway construction, maintained haul roads and graded to fine tolerances. Grading was carried out in blocks 500 to 800 feet long.

CATERPILLAR TRACTOR CO., SAN FRANCISCO, CALIF.; PEORIA, ILL., U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

WITH A HAMMERBLOW . . . 3 SHARP RAPS CUT WIRE ROPE CLEAN . . . *leave it round, ready for splicing or threading*



Write for name of your nearest stocking distributor

HAMMERBLOW
WIRE ROPE CUTTER CO.
26 Austin St. Newark 2, N. J. Bigelow 8-1045

New Equipment . . .

Continued from page 45

by public safety agencies, business and industrial firms. It is the first nationally-marketed portable to approach the sensitivity and quality of mobile radios usually installed on cars and trucks, G-E says.

In contrast to portables currently on the market using receiving tubes and partially-transistorized designs, G-E's new portable receiver is completely transistorized.

G-E transistor No. 3N36, engineered for frequencies up to 100 mc, will be used in the company's 25-54 mc low-band portable, which will be the first to come off the production lines. Units designed for high-band (144-174 mc) will be equipped with G-E transistor No. 3N37, engineered for use up to 200 mc.

Both of these transistors were developed under an Air Force contract and are being employed commercially in the G-E portable for the first time.

The new models are lightweight and compact and yet provide more audible signals than other portables. Sensitivity of the equipment (0.4 microvolts) will be extremely important in remotely-located areas where communications reception normally is poor. The new units are designed for use in buildings and outdoors, but will have their greatest usage in locations inaccessible to radio-equipped vehicles.

The unit's speaker is larger than those usually found in portable equipment, resulting in improved performance and less distortion.

While the receiver is standing by to receive a message, it drains less power than a small household-type flashlight. Because of the need of public safety groups and other users to operate for long periods of time without battery replacement, the G-E unit is supplied with large industrial-type batteries as standard equipment.

The new design increases the number of two-way radio users who can effectively use hand-carried equipment in combination with their regular mobile radio systems. The models are especially suitable for surveying and construction work spread out over wide areas.

Case Loader, Tilt-Top Trailer

Manufacturer: J. I. Case Co., Department EE, Racine, Wis.

Claims: A choice of bucket styles to fit job requirements is now offered on Case TerraTrac model 1000 crawler tractor-shovels.

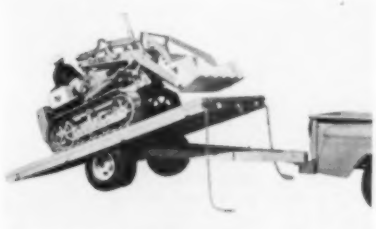
In addition to a front-hinged bucket with extra-high dump clearance designed for stockpiling and truck loading, a new rear-hinged bucket is now available on the 100-hp model for heavy-duty digging.

Both buckets are rated at 2-yd. capacity. However, the new rear-hinge design has more than 25% greater breakout force and about 600 pounds greater carrying capacity for handling heavy materials. It also is wider, shallower and has a steeper grading angle. Parallel skid-plates, which extend from

"Frank is sick today, ha, ha, so I persuaded my mother-in-law, ha, ha, to take his place."

the lift arm hinge to the cutting edge, increase breakout and provide an extra wear surface along the entire bottom of the bucket.

A number of features offered on the model 1000 TerraTrac crawler give it outstanding advantages with both types of buckets. These include torque converter drive capable of delivering up to 24,000 pounds drawbar pull or push; on-the-go power-shifting; high forward and reverse travel speeds; and ability to make fast counter-rotating spin turns within the track length of the machine, with full driving power on both tracks. Another feature, important in loader operation, is torsion-bar suspension, which permits both tracks to oscillate freely over rough ground while bucket remains level.



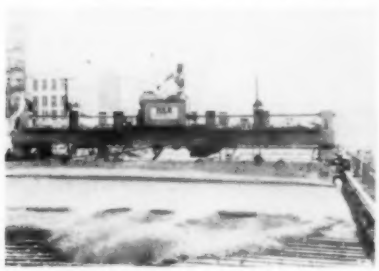
Case is also offering a new flat bed, 5-ton capacity, tilt-top trailer to owners of Case wheel or TerraTrac crawler tractors. Designated the model 90, the trailer can be hauled behind any light pick-up truck to move tractor quickly from job to job. One man can hitch trailer and load or unload tractor in less than two minutes. The trailer is equipped with safety brakes. Higher capacity Case trailers are also available for heavier TerraTrac models.

Bridge Finisher

Manufacturer: Chain Belt Co., Department EE, Milwaukee, Wis.

Claims: The Rex line of concrete finishing machines now includes a concrete bridge finisher.

Incorporating all the design and construction advantages of the standard Rex concrete road finishing machines, the bridge finisher is tailored to customer specifications and produced on a made-to-order basis. A great advantage to the contractor is the fact that the Rex bridge finisher can be converted into a standard road finishing machine with a minimum of labor.



Extremely flexible, the machines are adjustable both in elevation of the large screed and in frame width. In most cases, one machine can take care of most width requirements. Rex powered-frame widening is available to provide even more instantaneous width changes where desired. A quick crown change attachment is available for easy transition work, as is a hydraulic transportation rig complete with pneumatic-tired wheels, hydraulic lifting pedestal and hinged towing tonque for fast, efficient movement between job sites.

50% STRONGER

THAN COMMON SHACKLES

CROSBY-LAUGHLIN *
Load-Rated
SHACKLES

½ TO 75-TON CAPACITIES

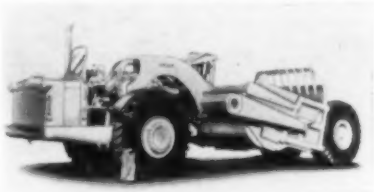
Guaranteed capacities are offered by new Crosby-Laughlin* "Load Rated" Shackles that have their safe working load drop forged in the body. Special steels, drop forged—heat treated, plus perfect pin alignment produce quality shackles actually 50% stronger than common shackles, *size for size!* Select from a broad line of round pin, screw and safety shackles in anchor and chain styles . . . be sure you get RED fittings—symbol of *genuine* Crosby-Laughlin "Load Rated" Fittings—it's the world's most complete line. *New catalog* now available from mill supply, construction or industrial equipment distributors. Or write:

*Trademark

CROSBY-LAUGHLIN *Division*

AMERICAN HOIST & DERRICK COMPANY
FT. WAYNE 1, INDIANA

Increased Scraper Capacity



Manufacturer: Euclid Div., Department EE, General Motors Corp., Cleveland, Ohio.

Claims: An increase in struck capacity from 18 to 21 cubic yards has been announced for the Euclid model S-18 scraper. Heaped load is 24 cubic yards at 3 on 1 and 30 yards at 1 on 1 slope.

The 21-yd. scraper bowl has a four-section reversible and adjustable cutting edge and roll-out ejector. Low, wide bowl is designed for easy loading and maximum stability. All scraper operations—bowl, apron and ejector—are controlled by hydraulic lever action. Greater structural strength has been built into the new S-18 to absorb punishment from today's "super tractors." Other S-18 advantages include new simpler maintenance and servicing features.

Power train of the new S-18 tractor includes a 325-hp engine and a four-speed Torqmatic drive with converter lock-up which provides better gradeability and faster travel speeds for a given grade. NoSpin differential is available as optional equipment. Standard tires are 27.00x33, with 33.5x33 as optional where extra traction and flotation are required.

Rough Terrain Tire

Manufacturer: General Tire & Rubber Co., Department EE, Akron, Ohio.

Claims: In an era of specialization, tires, too, have to be designed to do specific types of work, according to General Tire. The firm has introduced a rugged new tire constructed of Nygen cord for use in rough terrain by the construction, mining and logging industries.

Called the Rock Rib LCM, the new tire has an ultra-heavy ribbed tread with a variable slope in the groove design which aids in ejection of stones and rock fragments. Its thick tread and shoulders consist of a specially compounded, cut-resistant rubber stock. Four Nygen cord shock plies buttress the 12 to 20-ply

Continued on page 52

Get the Performance

In Cuba this 15-B Transit Crane works on the erection of 500 prefabricated houses. Concrete for the sections is poured into forms right at the job site, and allowed to dry for 72 hours. Sections are then trucked to the concrete floor slab. It takes the Transit Crane just three hours to unload and erect a three-room house. The job site is a new subdivision of Havana.

All the crane-excavators used on the Hildebrand Dam project in West Virginia are Bucyrus-Eries. The 22-B Transit Crane shown here has been termed the busiest piece of equipment on the job. It handles a variety of work, including loading and unloading trucks, hoisting forms into place, and handling steel. The machine is equipped with a 65-ft. boom and 20-ft. jib. Defying steep grades, the 22-B moves quickly to scattered locations at the job site. Hildebrand Dam is scheduled for completion in July, 1959.

At Cudahy, Wis., just south of Milwaukee, this 22-B erects steel for a new industrial building. Transit Cranes are ideally suited to this work because they speed to the job site, set up in a hurry, and perform the work quickly . . . economically. The 22-B shown here handles a variety of construction assignments.

Out of sight but doing its job, this 15-B Transit Clamshell scoops up earth from the inside of a partially completed building. Operator of the 15-B takes his cues from the oiler perched atop the wall. On this job, the ability of the machine to maneuver easily and dig on a sturdy foundation of four outriggers simplifies procedure . . . saves time and money.

With Devil's Gate Dam as a backdrop, a 22-B Transit Machine works at the bottom of 110-ft. deep Arroyo Seco. At this location the 22-B pours concrete for a bridge foundation on the Foothill Freeway at La Canada, Calif. Long boom gives needed reach; I-beam outriggers provide a solid stability.

These Contractors Enjoy!

The 22-B Transit Machine shown here performs many jobs for its owner. Among them are spotting bituminous concrete where needed for paved waterways, supplying gravel for fill, digging out soft spots, and furnishing leach. When this picture was taken, the Transit Machine had been on the job for 18 months, 10 hours a day, in places inaccessible to other equipment. Because it was able to remain on the paved highway in performing its many duties, it got around fast. It is shown paving drainage ditches on the Massachusetts Turnpike.

It's easy to understand why the owners of the Transit Machines pictured here enjoy outstanding performance. Transit Machines are busy moneymakers. They move from job to job at road speeds; provide quickly responsive, precise control for efficiency on any job; stay at work without time-consuming delays for maintenance and repairs; and offer outstanding front-end versatility for handling scores of different jobs economically.

All these advantages can be yours — with a Transit Machine. Get the complete story on the 10-ton Model 11-B, 15-ton 15-B, the 25-ton 22-B, and the 35-ton 30-B (convertible to ⅜, ½, ¾, and 1-yd. excavators respectively). See your Bucyrus-Erie distributor today!

473E58C

BUCYRUS ERIE

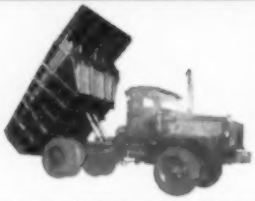
A Familiar Sign at Scenes of Progress

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

A 30-B Transit Machine is shown below, center, with a 38-B hoe and a 22-B equipped with clamshell. These machines work on a 7-mile water main to carry water from the Colorado River to Culver City, Calif. Their work takes them through 14 tunnels ranging from 40 to 300 feet. Heavy auto traffic also limits working area.

PRESS

ROCK AND QUARRY BODIES



Press Rock and Quarry bodies are designed to handle larger payloads and to give years of satisfactory performance. Get the facts today on Press bodies—there's a body available to meet your particular requirements.

99 YEARS OF QUALITY BODY BUILDING

SINCE 1859

JACOB PRESS' SONS, inc.

3308 S. Normal Ave., Chicago 16, Ill.

New Equipment . . .

Continued from page 49

tire body. Providing maximum steering ease, the tire reduces side slippage.

The Rock Rib LCM produced at General's Akron (Ohio) and Waco (Tex.) tire plants comes in sizes 10.00 x 20 through 14.00 x 25. It is available tubeless in sizes 12.00 x 25 and 14.00 x 25.

Lubricant Cartridges

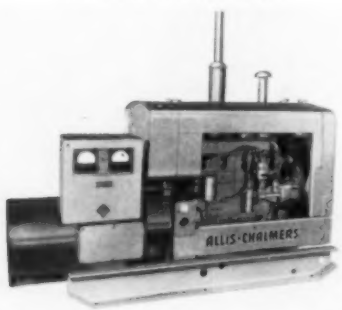
Manufacturer: D-A Lubricant Co., Department EE, Indianapolis 23, Ind.

Claims: D - A open gear and D-A lithium lubricants are now available in cartridges, in addition to conventional pails and drums.

The new lubricant cartridges offer users three advantages. 1) They eliminate waste that occurs where lubricants in large containers are not completely consumed. 2) They prevent contamination from dirt since they remain completely sealed until ready for use. 3) Through convenience, they save considerable time when loading grease guns and in application.

The D-A lithium cartridge has removable ends. These are removed and the cartridge slipped into any standard grease gun. The cartridge for D-A open gear lubricant is equipped with a spout and needs only to be inserted into any standard calking gun.

Portable Generator



Manufacturer: Allis-Chalmers Mfg. Co., Engine-Material Handling Div., Department EE, Milwaukee 1, Wis.

Claims: Allis-Chalmers had added to its line of power producing equipment a portable lightweight generator set developing 35,000 watts (35 kw).

The heart of this new W-226 generator set is a Power-Crater engine manufactured by Allis-Chalmers. The new unit provides either continuous or standby power for construction jobs, mines, quarries and in other applications.

The unit is complete as a package, with all controls and accessories needed for immediate use. Because it is completely weatherized, it can be used either outdoors or indoors. The switchboard and instrument panel are protected against weather, dirt and tampering by a completely enclosed cabinet with a glass door that can be locked.

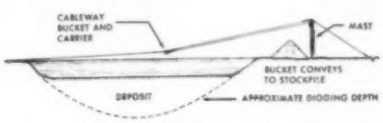
The W-226 has an overall length of 68 inches, is 26 inches wide and 37 inches high. It can be operated either by natural gas or gasoline.

Slackline Cableway Bucket

Manufacturer: Sauerman Bros., Inc., Department EE, 622 S. 28th Ave., Bellwood, Ill.

Claims: Characteristics of the Sauerman Crescent DragScraper are incorporated in the new Sauerman line of slackline cableway buckets. The design permits the bucket to be made lighter in weight for a given strength and it requires less line pull than other buckets of the same rated capacity.

The new Slackliner has a continuously curved cutting edge designed to quickly penetrate hard digging material and move it into the bucket with minimum resistance. This curve also gives more tension in the cutting edge and much less bending stress.



In developing the Slackliner, Sauerman took full advantage of modern design practice. The bucket is a complete welded assembly. There are rolled high-strength steel plates throughout and integral tooth bases.

The Slackliner is available in 1, 1½ and 2-yd. sizes.

The New Haven company ships its products by barge from Pine Orchard, Conn., to points along the southern New England coast.

New Haven . . .

Continued from page 21

brex 5 x 14-ft. double-deck sizing screen.

Recrushing facilities, employing 4-ft. Symons short head cone crushers, are maintained at all quarry operations.

As mentioned earlier, both Wallingford and Plainville use rear-end dumps to feed material into the apron feeders.

The New Haven Trap Rock Co., in addition to its quarry operations, also manufactures bituminous concrete mixes to the specifications of the Connecticut Highway Department, local highway departments, army, navy and Civil Aeronautics engineers.

Bituminous concrete is a mixture of crushed stone and asphalt. The company's first plant for manufacturing this product was erected in 1940 at North Branford. Following this initial installation, The New Haven Trap Rock Co. developed its own special mix known as "Blue Diamond Mix."

Crushed trap rock in bituminous concrete varies in size from 7/8-in. to minus .200 mesh. It is combined to produce a mixture providing uniform quality throughout. Constant laboratory checks are made to insure this uniformity. Today, The New Haven Trap Rock Co. is recognized as the largest producer of bituminous concrete mix in New England, with six operating plants located throughout Connecticut.

Aside from its trap rock and bituminous concrete operations, the company has received special recognition for its machine products division. This division was originally established to supply and provide employment for its personnel during winter shutdown and equipment overhaul, as well as for diversification of manufactured products.

The machine products division was organized in 1950, an addition to the firm's excellently equipped maintenance machine shop. This division is a fully integrated operation of its own, manufacturing precision components for the aircraft industry and its related guided missiles program. Recent research in this division has produced a universal gauge for measuring diameter and concentricity. At the present time, this division employs approximately 50 men and includes among its customers Pratt & Whitney, the Aircraft Engine Div. of the Ford Motor Co.; and Sikorsky and Kaman Helicopter Co.

Perhaps this diversification of products has over-shadowed the unusual employee relationship and safety records achieved by the New Haven firm over the years. One has only to take a look

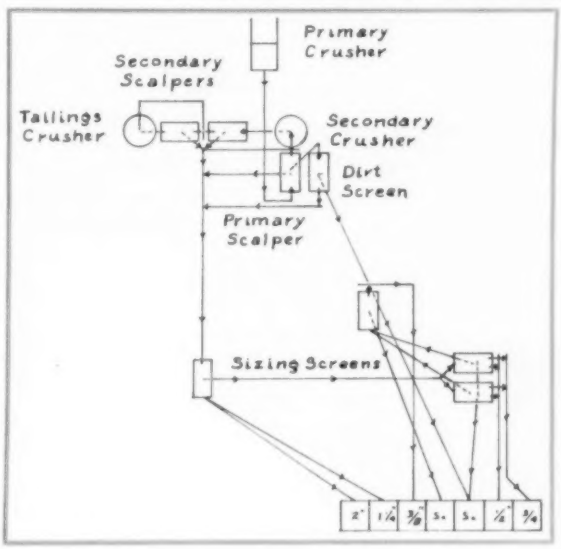


Diagram shows flow of material through the crushing plant at Wallingford, Conn.

at the employee roster at North Branford alone to recognize an excellent company-employee relationship during the past 40 or more years.

No less than 22 men have 30 years service. This group includes laborers, engineers, shovel operators, pit men, machinists and maintenance men. Almost 100 years service can be collectively claimed by the three plant superintendents at North Branford, Wallingford and Plainville. Robert D. Brewer, North Branford, has 33 years service; John H. McKernan, Wallingford, has 41 years service; and Charles F. Bass, Plainville, 20 years.

During the history of the company, constant recognition has been given to the company and its employees for their plant safety programs. The Bureau of Mines, the National Crushed Stone Assn., and the National Safety Council are among those who have recognized this record.

The company has also been active in the establishment of civic organizations which have played an important part, particularly with the youth, in the towns in which its plants are located.

Principal headquarters of The New Haven Trap Rock Co. are located at 265 Church St. in New Haven. Its officers are Ray J. Reigeluth, chairman of the board; Albert L. Worthen, president; Robert S. Reigeluth, executive vice president and treasurer; Edward T. Perry, vice president in charge of sales; Theodore W. Jones, vice president in charge of production; and Lester E. Hintz, secretary and assistant treasurer.

Bridge . . .

Continued from page 28

1951, when he came out of the engineering college at the University of Nebraska.

Esco Choisser is job superintendent. He is assisted by field superintendents Walter (Doc) Greer and Jerry O'Neil. Master mechanic on the job is Vern Devery, who shares maintenance responsibility with Wilbur Neely, crane superintendent. Other personnel include Eldon Choisser, carpenter superintendent; William Berryman, excavation superintendent; Red Carter, concrete superintendent; and Wallace Fowler, office manager.

Jim Gibson is project manager for Bethlehem Steel Co. and Jim Minnich is project engineer.

Cunningham-Kiewit-Paschen is presently running the job with about 200 men, including office personnel and engineers. Subcontractors on the job include Deslauriers Column Mold Co., furnishing and erecting columns; Audette & Lopina Co., reinforcing steel; and Roeth-Cutler Co., steel floor for the bridge deck. Granco Steel Products supplied various construction materials.

About 17,700 cubic yards of common were excavated for structures along with a little rock—300 yards. Those piers supported on piles required 6,450 lineal feet of 12-in. nominal diameter tapered pile shells.

In areas dewatered by cofferdams about 1,700 cubic yards of seal concrete were placed. In footings and above footings, 6,900 cubic yards of class K concrete were placed in substructures and superstructures; 16,995 yards of class M concrete were required.

Concrete Specifications

Ready-mix concrete for structures was brought in transit trucks from a batch plant of Consumers Co., located on Highway 66 in McCook, a distance of about two miles. Specifications required a 3,000-lb. 28-day ultimate strength concrete. Two types were used. In footings and blocks, class K concrete mix using a maximum 3-in. aggregate was placed. In columns, caps and superstructures, Class M concrete using maximum 1½-in. aggregates was specified. There were few concrete pours that couldn't be handled in the regular 8-hour shift. Occasionally there was some Saturday work.

Other job quantities include reinforcing steel for deck, 1,858,400 pounds; reinforcing steel for substructures, 1,469,270 pounds; wrought iron drain pipe, 9,701 linear feet; and prestressed girders, 37,998 linear feet.

Earthfill approaches to the bridge will require 92,380 yards of dirt; this work was sublet to Orr Construction Co., Chicago, prime contractor on a neighboring job.

Contracting engineer firm on the job is Maccabee, Campbell & Associates, Chicago. W. C. Chastain is resident engineer.

Chairman of the Illinois state toll highway commission is Austin L. Wyman. Charles L. Dearing is executive director and George L. Jackson is chief engineer.

When completed, the Cunningham-Kiewit-Paschen bridge will be the second largest continuous bridge structure in the state of Illinois, surpassed only by the high-level bridge of the Calumet Skyway.

Here is the size of the Allis-Chalmers Superior gyratory primary crusher. Picture shows how the material is carried away on a 48-in. Hewitt-Robins sectional conveyor.

Track Life . . .

Continued from page 31

the practice is soon halted. While the spinning of track doesn't usually draw the same immediate response, it, too, is "burning off dollars of iron." This is especially true when track is allowed to churn, digging in and over abrasive material. A little load adjustment or different approach can save that "burned off" track life.

When a tractor is operated in mud, clay or gumbo, material sometimes packs around the rollers, and usually builds up on top of the guards and around track carrier rollers. In freezing temperatures, packing causes even more trouble. When mud packs around a track roller or a carrier roller, it tends to "freeze" the roller and prevent it from rotating freely. Once roller rotation is stopped, the track links slide over the roller surface causing rapid wear to both the roller and the track rail surface. In a very short time, flats are worn on the roller. It takes engine horsepower to accomplish this rapid wear, so profit is lost in two ways.

It's easy to correct this problem. Drive the tractor to dry ground. Run forward and backward to work off the excess mud. If water is handy, a wash down of the track group will help. If no such facilities are available, a little time spent (periodically) in "spade work" to remove the mud will be a good investment.

Park On Platform

Sometimes a tractor will freeze to the ground overnight after operation in cold, muddy conditions. To prevent track damage when breaking it loose, clean off as much mud as possible. A common method of avoiding a freeze-in is to park the tractor on planks, logs or even brush to keep the tracks up out of the mud.

It is also a good idea to keep an eye on track adjustment when operating in mud and sand. These materials pack and tighten track, robbing engine horsepower and subjecting track parts and final drives to great stresses. It may be necessary to loosen the track adjustment during muddy operation to provide the desired slack.

Operating in snow presents much the same dangers as operating in mud. It is essential that the track group be kept as clean as possible and the rollers kept free to rotate.

(To be continued next month.)

at home in the water, too!
Williams Dragline Buckets

built to dig

WILLIAMS BUCKETS

moves material fast and efficiently!
Williams Rehandler Buckets

Williams Bucket Division, The Wellman Engineering Co.,
7010 Central Ave., Cleveland 4, Ohio, U.S.A.

NOT in the Contract

A bride and groom came down to breakfast in the hotel where they had spent the first night of their honeymoon.

"Now, be casual and offhand and they won't know we're newlyweds," cautioned the groom.

While he studied the menu, his bride gave her order to the waiter, "Tea and toast without butter, please."

Whereupon her husband exclaimed in a voice everyone in the place could hear: "Good heavens, is that all you eat for breakfast?"

Customer: "Is that a genuine bloodhound?"

Owner: "Certainly! Oscar, bleed for the man."

Pat, the old Irishman, was just about done for and laid quietly on his deathbed. His doctor had told him he had but a few hours left. The sweet smell of baked ham from the kitchen reached him. He called his wife and said, "Before I die, I would like to have a slice of that ham you just baked." "I'm sorry Pat," said his wife, "I can't give you any; that ham is for the wake."

"Thought you were going to visit that blonde in her apartment tonight."

"I did."

"How come then you're home so early?"

"Well we sat awhile and chatted. Then suddenly she turned out the lights. I can take a hint."

A campaign worker for the successful candidate for mayor called on him to see if he could get a job for his son on the city payroll.

"Oh, I think so," said the mayor. "What does he do?"

"To tell the truth," said the man, "nothing."

"Good," said the mayor. "We won't have to break him in then."

"Now don't get excited, Miss! It's no holdup. Just want to see the boss about this hammer."

"Pop, will I look like you when I grow up?"

"Everybody seems to think so, son."

"Well, I won't have to grow up for a long time, will I, Pop?"

A very nervous man who had been unemployed for some time at last found a job in a china warehouse. He had been at work only a few days when he smashed a large vase. He was summoned to the manager's office where he was told that he would have money deducted from his wages every week until the vase was paid for.

"How much did it cost?" asked the butter-fingered culprit.

"$300," replied the manager.

"Oh, that's wonderful," the culprit exclaimed. "At last I've got a steady job."

He: "Do you serve women at the bar?"

Bartender: "Sorry, you will have to bring your own."

A Scot went to his banker to get a loan of $10, offering as collateral a government bond for $1,000. When the deal was completed, the banker asked the man why he wanted to put up a $1,000 bond as security for a $10 loan.

Scot: "Well, you see, a safe-deposit box costs me $4 a year. This way you keep the bond safe for me and I pay you 60 cents a year interest. I make $3.40 per year."

"I used to be terribly conceited," a Hollywood actor confided, "but my psychiatrist straightened me out and now I'm one of the nicest guys in town."

Shortly before the invasion, a general and his staff were watching a troop-carrying glider go by. From it came a carrier pigeon. Powerful field glasses followed the bird to a nearby field. A colonel ran over, caught the bird, took the message from its leg and raced back to the general who read it, cursed and threw it to the ground. The colonel picked it up and read, "I have been sent down for being naughty in my cage."

"You are very run down," said the doctor to his patient. "I suggest you lay off golf for a while and get a good day in now and then at the office."

He went to an agricultural college and his classmates voted him "the boy most likely to sack seed."

for Better Value

American Cable VHS®

DRAGLINE OPERATOR SAYS,

"Tru-Lay VHS is in a Class by Itself"

John Yamulla, dragline operator of Yamulla Excavating Company, Gowen, Pennsylvania, says, "TRU-LAY VHS is in a class by itself because it lasts and lasts. I never saw any other grade of wire rope give so much service through the beating we hand it! Before we started using TRU-LAY VHS, 600 hours of service was about all we could expect from a line. Since taking on TRU-LAY we average 1000 hours—a savings in rope replacement and equipment down time that adds into really big money."

Makes the Toughest Jobs Seem Easy

TRU-LAY VHS is actually the first entirely new grade of wire rope to be introduced in years. Before VHS (Very High Strength) came along, Improved Plow Steel was the highest grade of wire rope you could buy. For certain types of earth-moving jobs, TRU-LAY Preformed Improved Plow Steel still is the best line to use. But, where extra strength and toughness are called for—as in the case of draglines, shovel hoist ropes, scraper and dozer cable—you'll be dollars ahead using TRU-LAY VHS.

Here's the Secret of VHS

The answer lies in a new grade of rope wire developed by ACCO's own process. Made from premium steel billets carefully selected for the very finest chemical and physical properties, this new rope wire is processed into a line that's tougher, more wear resistant, and 15% stronger than Improved Plow Steel.

Only One Source for VHS

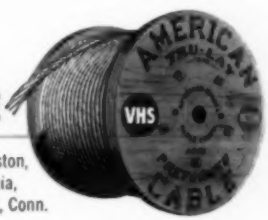
Remember . . . there's only one superior grade of wire rope on the market today—VHS; and only one company makes it—American Cable! Tell your distributor you want VHS the next time you order.

ACCO

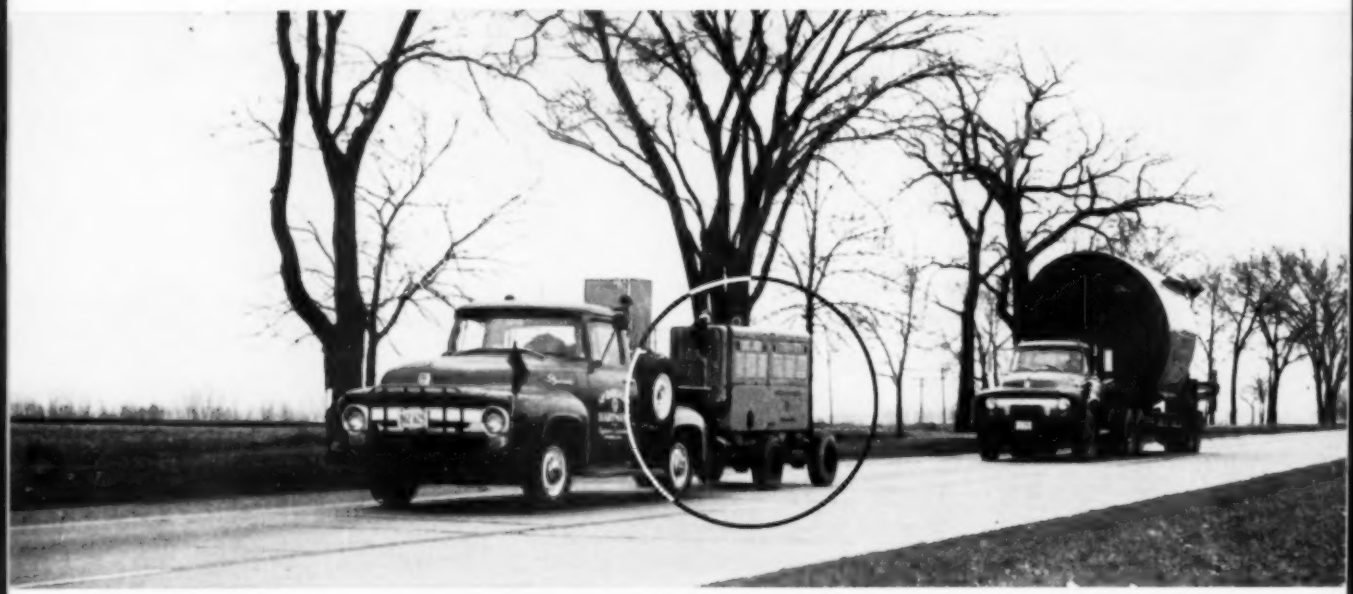
American Cable Division

AMERICAN CHAIN & CABLE

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Houston, Los Angeles, New York, Odessa, Tex., Philadelphia, Pittsburgh, Portland, Ore., San Francisco, Bridgeport, Conn.



Cat power saved these owners $1,300



1 McDougal-Hartmann Co.'s, Heltzel Bin Hardy and Johnson Automatic Batching Plant follows their 40 KW Cat D315 Portable Electric Set to its fourth job site. Savings during the first year of ownership while moving them, alone have amounted to $3,900. Operational savings are not even included. The owners estimate that running in and hooking up to public utility power would have averaged at least $1,300 per move. An additional $1,200 was saved at the outset since the Electric Set would operate the plant's higher voltage electric motors which were supplied as original equipment.

2 At a previous job location in Sterling, Illinois, this unit produced 86.4 batches per hour for use on one of the firm's nearby road construction jobs.

Without portable power, it often requires the more common technique of setting up the batch plant along a railroad siding or right-of-way, bringing in materials by rail if the haul distance to the job is not excessive. Concrete specifications in some states limit the haul distance of mixed concrete due to the time element. All in all, Cat portable power saves operating time, cuts costs.

3 Many contracting companies with multi-state operations, such as McDougal-Hartmann, require power portability to avoid the frequent high cost and inconvenience of obtaining power in remote areas.

On their present job it would have necessitated stringing poles and wire from this power line to the plant location (in the circle). Instead, the highly mobile Cat Electric Set was rolled up alongside the batching plant, and hooked up with wall plug simplicity ready to go.

each time their batching plant moved

4 Performance and savings with this plant brought Mr. Jack Hartmann, Vice President (right), and Bud Moore, his C.D.E.S. (Caterpillar Dealer Engine Specialist), out to the job to plan a second batching plant installation. Satisfaction resulted in an order for a second identical Cat Electric Set for this contractor's expanding operations.

Mr. Hartmann remarked, "ABOUT ONE MORE MOVE AND OUR FIRST PORTABLE ELECTRIC SET WILL HAVE PAID FOR ITSELF IN SAVINGS FROM MOVES ALONE AND IN LESS THAN TWO YEARS. THAT WE LIKE TO SEE."

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

5 The all-new, self-regulated generator for Cat Electric Sets is simple to operate. Voltage is adjustable from 5% above to 10% below nominal rating and regulated within 3½% of rated voltage. It has unsurpassed motor starting ability. Other performance features Mr. Hartmann liked were:

1. Low over-all cost per operating hour.
2. No down time due to power failure or engine failure.
3. No additional help required, due to the unit's simplicity and self-regulating standard equipment.
4. Advertised power produced and maintained.
5. His Caterpillar Dealer Engine Specialist, Parts and Service teams were on around-the-clock availability if anything went wrong. It didn't.

ENGINE POWER BY CATERPILLAR

If something has gone wrong with your present engine or it just won't produce in your excavator, crusher or other construction machinery, talk it over with your C.D.E.S. He can aid you profitably when repowering older machines or specifying engines for new equipment.

Engine Division, Dept. EE8
CATERPILLAR TRACTOR CO., Peoria, Illinois, U.S.A.

Send me more information about the new Caterpillar Portable Electric Sets. I understand that I am under no obligation.

☐ I would like more detailed information as I may be in the market for a Caterpillar Construction Engine.

Name _____

Company _____

Address _____

City _____ Zone ____ State _____

STANDS UP TO SEVERE USE

and

even

abuse

One word describes a Hayward — *ruggedness*. Yes, it's as tough, strong, sturdy as a bucket can be — and even more so. Extreme simplicity, little if any upkeep, high operating efficiency! Details on request. Write! THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES

famous for performance since 1888

New Trade Literature

Subject: **Dredges**

Content: Six basic types of dredges are described and illustrated in a 12-page Ellicott bulletin. Photographs, profile line-drawings and text material detail the grapple, dipper, bucket, plain suction, self-propelled hopper and cutterhead pipeline types. Also explained are the compact "Dragon" models, Ellicott's line of standardized portable hydraulic dredges. Additional information is provided on numerous applications, such as highway construction, land reclamation, canal digging, flood prevention, river improvement, mosquito control and sand and gravel production. Also included is description of a complete line of special equipment, including dredge tenders, skid-mounted pumps for mining, ball-joints, cutters and winches. Ask for bulletin #935.

Where to get: Ellicott Machine Corp., Department EE, Baltimore, Md.

Subject: **Surveying Handbook**

Content: A 32-page handbook lists practical applications for the use of David White levels and level transits. Entitled *From Point to Point*, it contains general descriptions of the instruments as well as specific instructions as to how each instrument should be used. Various sections tell how to set up each instrument, how to read horizontal and circle verniers, sighting and focusing the telescope, adjustment instructions and handling precautions. Complete instructions as well as detailed drawings are also included for leveling, measuring angles, laying out angles, laying out a building lot, determining contour lines, setting batter boards, running straight lines either with a transit or a level and establishing vertical lines and planes. Price of the booklet is 25 cents.

Where to get: David White Instrument Co., Department EE, 2051 N. 19th St., Milwaukee 5, Wis.

Subject: **Caterpillar Equipment**

Content: Three Caterpillar booklets provide concise, illustrated information. *Four Years of Improvements in the Caterpillar D8 Tractor* is a handy reference guide to the engineering advances that have been made in the firm's second largest tractor model. Many of these, not readily noticeable on the machine, are illustrated in detail in the brochure. A large cross-section view of the machine is keyed to show the major improvements. Ask for form 33178. Particulars of Caterpillar dealer's bonded used equipment values under three guarantees are covered in the second booklet, *For Used Equipment You Can Trust*. These are the "Bonded Buy," "Certified Buy" and "Buy and Try" programs. The booklet is illustrated with photos and specimen copies of the bond guarantees. Provisions of the guaranteed $10,000 bond backed by Lumbermens Mutual Casualty Co., Chicago, Ill., are detailed. Ask for form 32813. Actual job reports showing production and costs for Cat DW15-No. 428 tractor-scrapers are featured in a 12-page booklet entitled *Moments of Decision*. Ask for form D829.

Where to get: Caterpillar Tractor Co., Advertising Div., Department EE, Peoria, Ill., or Caterpillar dealers.

Subject: **Clearing Blade**

Content: A six-page booklet describes the Rome K G clearing blade for shearing trees and building windrows. Photos show how the blade operates on a wide variety of applications. In addition to clearing land, the Rome K G blade is suitable for building woods roads, firebreaks and "V" type drainage ditches in forests or open fields.

Where to get: Rome Plow Co., Department EE, Cedartown, Ga.

Subject: **International Tractors**

Content: The International TD-14 and TD-18 diesel tractors are described in two new 16-page catalogs. The TD-14 booklet lists details of the engine, fuel injection system, all-weather starting, cooling system, lubrication, cerametallic engine clutch, power train, steering clutches, main frame and case, track frames and components, operation and equipment, and attachments. Ask for form CR-630-H. The TD-18 catalog is well illustrated by photos and schematic drawings, and also covers all components of the heavy-duty tractor. Ask for form CR-631-H.

Where to get: International Harvester Co., Construction Equipment Div., Department EE, 180 N. Michigan Ave., Chicago 1, Ill.

New Movies . . .

Subject: **Uranium Mining**

Content: *Power from Uranium* is a 20-minute Allis-Chalmers color film telling the step-by-step story of the mining and processing of the world's newest treasure—uranium. Starting in scenic canyon and desert country, where a clicking Geiger counter denotes a rich deposit, A-C bulldozers carve roads to remote mining areas as other construction and mining equipment burrow into the earth, load the uranium ore and provide the power needed for the stripping operations. Following the ore from the mining site to the recovery mill, the film shows the beneficiation process in which uranium concentrates are extracted. A model of the Argonne National Laboratory's experimental boiling water reactor, which Allis-Chalmers helped equip, shows how the fissioning of these uranium fuels liberates the tremendous power of the atom and transforms it into useful steam and electric power. Also shown in the film is A-C power equipment for the nuclear power plant being manufactured and this equipment in operation.

Where to get: Allis-Chalmers regional sales offices or Allis-Chalmers Mfg. Co., Department EE, Milwaukee, Wis.

Midland Collieries Inc. Shovel Location – Victoria, Ill.

Peabody Coal Co. Shovel Location – Freeburg, Ill.

Hanna Coal Co. Shovel Location – Cadiz, Ohio

Simco-Peabody Coal Co. Shovel Location – Cashocton, Ohio

WORLD'S LARGEST—The MARION 5760

MARION

POWER SHOVEL COMPANY

MARION, OHIO, U. S. A.

A Division of Universal Marion Corp.

Marion manufacturers a complete line of excavators from ¾ to 75 cubic yards

These Marion 5760s are machines of tremendous proportions and amazing production capacities. With dipper sizes from 60 to 70 yards and boom lengths up to 150 feet, they strip up to 120 feet of overburden and deposit it almost a block away. These giant machines are piling up impressive performance records, month after month, in coal fields. Two of the four have already moved over 2,000,000 cubic yards in a single month.

Consult Marion Mining Specialists for Lowest Costs on Your Property

TO ADVERTISE: All advertising in this section is payable in advance. Rate: $1.00 per line, or $12.00 per inch of 12 lines. Minimum charge $4.00. No discounts; no commissions. Please count your copy carefully to avoid delay. Each line contains 41 characters (34 characters if all capital letters are used). Count spaces and punctuation as one character each. Allow 10 characters for box number, if blind advertisement is desired. Be sure to enclose the correct amount of money with your order. Closing date—10th of preceding month. Example: January closes December 10th.

TO INQUIRE: Be sure to address your inquiry to the advertiser by using the correct box number. Mail your letter in care of Excavating Engineer, South Milwaukee, Wisconsin. Write each advertiser a separate letter. Do not write us for name and address of advertiser. This information will not be given out. We have no information about the equipment advertised other than that shown in the advertisements themselves.

LARGE SHOVELS, CRANES, DRAGLINES — 3 YDS. & UP

Bucyrus-Erie Model 200-W diesel dragline, shop number 766, new April 1951, equipped with 125' boom and powered with Cooper-Bessemer GS-6 diesel engine. Included are one 5 cubic yard Bucyrus-Erie type AX bucket, one each 6 cubic yard Esco and Hendrix buckets and $23,000 worth of spare parts. Location Central United States. Box 3736.

650-B Bucyrus-Erie Elec. Drag, 195', 16 yd.

15-W Bucyrus-Erie Elec. Drag, 215', 13 yd.

631 Page Elec. dragline, 200', 8 yd.

9-W Bucyrus-Erie Elec. drag, 200', 8 yd.

625 Page diesel drag, 150', 10 yd.

723 Page diesel drag, 130', 10 yd.

621-S Page diesel drag, 125', 7 yd.

200-W Bucyrus-Erie diesel drag, 125', 6 yd.

7-W Bucyrus-Erie diesel drag, 180', 5 yd.

5-W Bucyrus-Erie diesel drag, 120', 6 yd.

2400 Lima drag, 130', 5 yd.

4500 Manitowoc drag, 120', 5 yd.

3900 Manitowoc Speederane, 100' boom

3500 & 3000 Manitowoc crawler cranes

5480 Marion 18 yd. elec. H. L. shovel

170-B Bucyrus-Erie 6½ yd. elec. shovel

120-B Bucyrus-Erie 4 yd. elec. shovel

1400 P&H 4 yd. elec. shovel

Large selection of smaller shovels and draglines available

Model T-750 Reich truck mounted rotary and down-the-hole drill

Lima Model "C" roadpacker

Euclid trucks, truck cranes, dozers, scrapers, front end loaders, drills, buckets, attachments and other misc. equipment available.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
GLadstone 5-3658
Hazleton, Pennsylvania

SMALL SHOVELS, CRANES, DRAGLINES — UP to 2½ YDS.

Bucyrus-Erie 38-B crane boom, 85', complete with mast, pendants, drum lagging and hook block—perfect condition. For details consult—

POLK EQUIPMENT CO.
490 N. Broadway Bartow, Florida

One AC 3000 Manitowoc dragline, Serial #3200 equipped with Buda diesel engine, Serial #6U844, 90' boom, 24" shoes, 14'6" crawlers, live boom, two point sheaves, and 2-yd. clamshell bucket. This machine can be seen at Baton Rouge, La.

One Model 605 Koehring dragline, Serial #C7461, equipped with Caterpillar D13000 engine, 60' boom, 36" track shoes, 16'6" crawlers, with 1½ yd. clamshell bucket. This machine can be seen at Baton Rouge, La.

For more information contact Mr. Walt Walton

LOUISIANA MACHINERY CO.
P. O. Box 1812 Monroe, La.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

Model 820 Lorain 2-yd. crane-clam-dragline combination with Cat. D-13000 diesel engine, swamp cats, 110' flange type boom, fairlead, presure lubrication, excellent condition. Available immediately for sale or rental.

Bucyrus-Erie 1¾ yd. model 33-B crane-dragline combination, 70' boom, independent boom hoist, gas power, very good condition. Ready to work.

Model 82 Lorain 2-yd. crane-dragline combination with Cat. D-13000 diesel engine, standard crawlers, 70' crane boom, pendant suspension, fairlead, new crawlers. A real value at $13,950. F.o.b. Milwaukee, Wis.

Maxi-mounted Bucyrus-Erie 30-B wagon crane, 35-40 ton capacity, with GMC series 4-71 diesel engine, 50' pin connected boom, pendant suspension, tagline reel, independent propel, 14:00x 24 tires and extra brakes. Machine used 3 months—like new condition. Priced $20,000 below today's cost.

Lima model 604 1½-yd. crane-dragline combination, serial No. 324167, purchased 1951, Cummins diesel engine, 80' boom, fairlead, overhauled last winter, very good condition. Price at job site .....$32,500.
Hoe attachment available for .....$ 4,000.

Lima model 1201, 3-yd. crane-dragline combination, new in 1950, good working condition. Priced to sell.

Adnum blacktop paver, 1951 model, serial No. 1958, Hercules OXC engine, good working condition. Priced right .....$3,950. F.o.b. Evanston, Illinois.

Foote Kinetic asphalt mixer, type EM, Hercules 2xb, 21 h.p. engine. Never been used! Chicago location .....$750. F.o.b. Evanston, Ill.

Bucyrus-Erie model 22-B ¾ yd. shovel attachment, including dipper. Bargain!

J. P. WAITE, INC.
3304 W. Pierce Street Phone: EV 4-1900
P. O. Box 313 Milwaukee, Wis.

Bucyrus-Erie 120-B dragline, 100' boom with gantry mast, 4' tracks, A-1 condition, located northern California. For sale or lease.

THURMAN & WRIGHT
625 Market Street San Francisco, Calif.

Used Lorain TL-20 dragline excavator, serial #18422, with Cat D311 engine with direct electric starting, 22 in. wide treads, 30 ft. basic boom plus one 10 ft. insert, ⅜ cu. yd. dragline bucket. Also has shovel front attachment and dragshovel front attachment.
Price F.o.b. Greensboro, N.C. $11,500
Used backhoe attachment for Northwest 25.
Price F.o.b. Greensboro, N.C. $1,500

E. F. CRAVEN COMPANY
Greensboro, N. C.

2—Bucyrus-Erie 54-B shovels. Serial #50044 and #41741. Both have standard length booms and crawlers, heavy duty buckets, light plants and are powered with Buda engines. Newer machine is in perfect condition and priced right at $40,000. Older machine is working and in equally good condition but for tracks, and is priced at $33,000. Located near Pottsville. Never used in coal stripping.

GEORGE YAEGER
1603 Elk Ave. Phone: MArket 2-7207
Pottsville, Pennsylvania

Marion Model 93-M, 2½ yd. shovel, Serial No. 21514. Delivered new June, 1956. Powered by Caterpillar 337-F Diesel engine with Twin Disc, 3-stage, Torque Converter, 36 in. pads. Price, F.o.b. Birmingham, Ala.—$57,750. Box 3735.

SMALL SHOVELS, CRANES, DRAGLINES—UP TO 2½ YDS.

1—22-B shovel front complete less dipper trip. Excellent condition.
F.o.b. Cleveland, Ohio $1,500
Also dragshovel attachments for:
1—Koehring model 304 with ¾ yd. and ½ yd. dippers. Fair
1—P & H Model 255A. Good
1—Lorain model 41 or model 50. Excellent.

THE W. T. WALSH EQUIPMENT CO.
12750 Berea Road Cleveland 11, Ohio

1—International truck chassis model KR-11, 149" wheel base Ca. 4-6 tons. Motor RED-450-15662 cab model HFA-58766 chassis #10334 dual tires used as sprinkler truck.
1—Dart truck model 120-BHD complete, serial #2923 Eng. #WAKH-51072—sprinkler truck.
2—Bucyrus-Erie 54-B Ward-Leonard Electric shovels serial Nos. 23191 and 46637 with 2½ yd. dippers.
1—Bucyrus-Armstrong Elec. blast hole drill, model 26 Shop #12324.
2—Bucyrus-Erie model 27-T electric blast hole drills, Shop #23446 and 79821, with 15 h.p. G.E. motors.
1—Le Roi Air Master portable air compressor, serial #206X1985, type 210D with International Harvester engine model UD14A, serial #UDE34 175-LR13.

PICKANDS MATHER & CO.
Purchasing Department 700 Sellwood Bldg.
Duluth, Minnesota

TRACTORS

INTERNATIONAL TD-24 Diesel Tractor, torque drive w/crankcase guard, pull hook, elec. starter, canopy top and hydraulic bulldozer. Good operating condition $11,500

ALLIS-CHALMERS HD-20H Diesel Tractor w/Garwood Bulldozer and DD.P.C.U. Operating condition $10,500

CATERPILLAR D8 Diesel Tractor, with Hi-Output engine, Cat 8S Hydr. Bulldozer. Certified Buy $15,500

TRENCHER

CLEVELAND No. 95 Trencher, option 5, 16 in. buckets, 21½ in. cut, powered by Continental gasoline engine. Rebuilt. Good value $6,600

SHOVEL ATTACHMENT

BUCYRUS-ERIE Tunnel Shovel attachment for 22-B consisting of 14 ft. boom, 12 ft. 10 in. stick, 1 cu. yd. rock dipper, crowd drum, sprocket and crowd chain.
Excellent condition $2,200

SHOVELS

BUCYRUS-ERIE 38-B Shovel, 20 ft. 5 in. dipper stick, 1¾ cu. yd. dipper, powered by International Diesel engine.
Present condition $28,000

LORAIN Mod. L820, 2 yd. combination Crane, Clamshell and dragline, 50 ft. boom, Rudomatic tagline and fairlead, 35 in. pads, Waukesha Diesel engine. Rebuilt and guaranteed ..$35,000

BUCYRUS-ERIE 15-B Backhoe, (½ yd.) powered by Waukesha gas. engine w/elec. starter. (Shovel Attachment available for $1,000)
.....$7,000

TRUCK CRANES

LORAIN Model 40 Moto-Crane, ¾ yd. capacity, with 70 ft. boom, Rudomatic tagline, outriggers, gasoline engines, mounted on factory carrier with 11:00x20—14 ply tires front and 14:00x20—20 ply tires rear.
Good operating condition $11,500

LIMA Paymaster Truck Crane, Type E34, ¾ yd., 35 ft. boom, powered by 6 cylinder Buda gas engine; mounted on Brockway 6x6 truck carrier with ten 12:00x24 tires.
Reconditioned $13,000

Subject to inspection & prior sale

H. O. PENN MACHINERY CO., INC.
140th Street & East River CYpress 2-4800
New York, N.Y.

SMALL SHOVELS, CRANES, DRAGLINES — UP TO 2½ YDS.

NORTHWEST model 80-D, 2½ yd. shovel & dragline, including 60 ft. boom & bucket. S/N 12504. Murphy Diesel Engine completely rebuilt. Most of machine in good condition.
KOEHRING model 304, ¾ yd. shovel, dragline, & hoe. Excellent condition. GMC 4-71 engine has had less than 800 hours use.
NORTHWEST model 25, ¾ yd. shovel, dragline, & hoe. 30 in. track shoes. Excellent condition. S/N 16806.

Call — Wire — Write
LANG CONSTRUCTION EQUIPMENT CO.
P.O. Box 1646 **Salt Lake City, Utah**
DAvis 2-1241 **TWX Number SU-278**

Lorain Model L50, 1 cu. yd. capacity, 70′ boom, pendant suspension, fairleads, tagline, long and wide tracks $14,000
Schield Bantam Model M49 backhoe and crane with 35′ boom, mounted on White halftrack, ... $5,500
Link-Belt model LS50, ½ yd. capacity, shovel and backhoe crawler mounted, Buda gasoline engine $6,000
"Quick-Way" model L, ½ yd. capacity, 40′ boom, mounted on White halftrack $5,500
Unit ½ yd., shovel, crawler mounted. Powered by Chrysler gasoline engine $3,500
Koehring model 304, ¾ yd., backhoe, crawler mounted, with IHC model UD14 diesel engine, ... $10,500
"Quick-Way" model S, ½ cu. yd. backhoe, mounted on White halftrack $3,000
The above prices F.o.b. Elizabethtown, Ky.
Insley model K12, ½ cu. yd. capacity, powered by Buda gasoline engine, with shovel front and 40′ boom for dragline. F.o.b. Evansville, Indiana. $6,000. Subject to prior sale.

BRANDEIS MACHINERY & SUPPLY CO.
Write-Wire or Phone Jim Waddell
Brook & Warnock Sts. **P.O. Box 1705**
MElrose 7-4741 **Louisville 1, Ky.**

MISCELLANEOUS EQUIPMENT

¾ cu. yd. slightly used, type AX, medium duty dragline bucket complete with fittings. Weight 1,900 pounds. Special reduced price $916. F.o.b. Bellwood, Ill.

BUCYRUS-ERIE COMPANY
Evansville, Indiana

Standard Batch Type Asphalt Plant, 4-compartment bin, scales, pugmill, bucket elevator, feeder pumps, electric motors—there is no dryer or gradation unit.
A steal at $15,000
International TD-24—new in '55—B-E Double Drum Power Control Unit—Straight Dozer. This 24 has had very good care and has very few hours for age.
F.o.b. Denver, Colo. $18,000
Allis-Chalmers Model HD-11, Model TS-11 Tracto-Shovel 2½ yd. Bucket, Model 9800 Ripper—this machine is ready to go to work—you won't find a cleaner machine in this class.
F.o.b. Denver, Colo. $17,000
Lorain TC MC254, powered by Cat. D315 engine, equipped with 60 ft. boom, fairlead, extra counterweight and outriggers, mounted on CCC.
Used Excavator Attachments, priced right—
B-E 22-B Shovel Attachment $1,250
Model 'L' Quickway Shovel Attachment, like new $1,250
B-E 54-B Dragline Boom Standard Fairlead and Counterweight $2,650
B-E 30-B Shovel Attachment, like new .. $4,500

THE COLORADO BUILDERS' SUPPLY CO.
EQUIPMENT DIVISION
West Evans and South Mariposa Streets
Phone: WEst 5-3571
Denver, Colorado

Model 27-T blast hole drill, serial No. 19628, Waukesha gasoline power, crawler-mounted, 33′ one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3719

1—Front mounted Tractomotive Backhoe attachment for Allis-Chalmers Model HD-5 tractor. Like new. Priced to sell.

SCHROEDER CONSTRUCTION COMPANY
818 Jules St. **St. Louis, Mo.**
ADams 3-2597

MISCELLANEOUS EQUIPMENT

3—New, unused, 3 cu. yd. type "BU", Bucyrus-Erie lightweight dragline buckets with all fittings. Weight—5150 pounds each. Special reduced price—$2000 each. F.O.B. Evansville, Ind.

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

1—210 Gardner-Denver compressor, 1953, Cat 318 Diesel engine.
1—Northwest model 25 crane with 45 ft. boom.
1—Lorain ½ yd. backhoe.
1—½ yd. shovel attachment for Osgood machine, excellent condition.
1—D4 Cat with Trackson hydraulic loader, 1 yd., 1950 model.
1—Model H Scoopmobile, Hydraulic loader, ¾ yd., 1955 model. Excellent condition.
1—12 ton single axle trailer (7:50x20 tires new) air brakes new.
1—Model C Scoopmobile 22 ft. tower, pallet fork or bucket, excellent condition.
1—Model BB120 Wooldridge scraper, 14 to 18 yd., good.
1—Model 41 Lorain ¾ yd. shovel with Cat D4600 engine, 1945 model. Needs some repair.

CONTRACTORS SUPPLY
620 East 18th St. **Kansas City, Mo.**

1—Used ⅜ cu. yd. double ram clamshell bucket for H-3 Hydrocrane. Special reduced price $700. F.o.b. Evansville, Ind.

BUCYRUS-ERIE COMPANY
Evansville, Indiana

BUCKET LOADERS

Barber-Greene model 543 bucket loader, 3 cubic yards capacity per minute. Loader mounted on pneumatic tires. Like new condition, used only eight months. Current model loader. Replacement price, F.o.b. factory, $13,000. This loader, F.o.b. Evansville, Ind. $6,000.

Write — Wire — Phone
L. L. Freeman

BRANDEIS MACHINERY & SUPPLY CO.
P.O. Box 27 **HArrison 3-4491**
U.S. Highway 41, North at Diamond Avenue,
Evansville, Indiana

Model 27-T blast hole drill, serial No. 18269, Waukesha gasoline power, crawler-mounted, 33′ one-piece all-steel derrick complete with tools in good working order. Located in Missouri. Priced to sell. Box 3718

BARBER-GREENE model 840-B asphalt plant. Includes mixer, hot elevator, dryer, dust collector, tank car heater, feeders, towing trailers, tanks, piping and 879 finisher. Excellent condition. Only two years old. Attractive price. Immediately available.
ADNUN blacktop paver. S/N 1462. Good operating condition. Low price.
BARBER-GREENE model 879A asphalt finishing machine. Completely rebuilt. Good as new.

LANG CONSTRUCTION EQUIPMENT CO.
P.O. Box 1646 **Salt Lake City, Utah**
DAvis 2-1241 **TWX Number SU-278**

2—3 cubic yd. type "BM" medium duty, thoroughly reconditioned dragline buckets complete with all fittings. Weight 4800 pounds each. Special reduced price $2,508 each. F.o.b. Evansville, Ind.

BUCYRUS-ERIE COMPANY
Evansville, Indiana

8—Warner-Swasey Gradalls, Mod. 2460, serial numbers NP26372 to NP36545, priced from $13,000 to $17,000.
1—Caterpillar D8 #15A1677 with 8S blade and #29 cable unit—$20,000.
5—Caterpillar D6 Dozers, serial numbers from 9U776 to 9U18435, priced from $7,000 to $8,000.
1—Caterpillar D4 Traxcavator #7U19045—$4,500.
1—Allis-Chalmers HD-15C #2986, Dozer—$8,500.
1—LeTourneau-Westinghouse C Tournatractor #GW70329, torque converter, dozer—$17,500.
5—LeTourneau-Westinghouse C Tournamatic Tournapulls, serial numbers GT6049 to GP50154, priced from $15,500 to $17,500.
8—LeTourneau-Westinghouse D Tournapulls, serial numbers GT8625 to GT8898, priced from $7,500 to $11,000.

ARNOLT BROS., INC.
P.O. Box 489 **Phone: LIberty 8-6400**
Metuchen, N. J.

MISCELLANEOUS EQUIPMENT

The following equipment is located at Dallas:
HU Hough Ldr., good condition $9,600
Cat 12 M/G, reconditioned $10,500
TD-14 IHC tractor with B-E dozer, reconditioned $9,500
TD-14 IHC tractor with 14K3 Drott Ldr., rebuilt & guaranteed $15,500
TD-18 IHC tractor with B-E hyd. dozer, reconditioned $10,000
TD-24 IHC tractor with dozer and P-29 winch, good condition $21,500
46-FD Euclid dump truck, excellent condition $22,500
D8 Cat tractor with cable B/grader, good condition $11,500
The following equipment is located at Houston:
1—Insley L ¾ yd. backhoe, Cat D315, 30 in. shoes, item B-672 as is $8,995
1—Bucyrus-Erie 15-B backhoe, UD-9 diesel, mounted on tractor type tracks, as is .. $7,950
1—Schield Bantam M-47 dragline (mounted on 6 x 6 G-I truck), 30 ft. boom and Erie ⅜ yd. clamshell bucket, item B-708, as is .. $1,950
1—Lorain TL-25, ¾ yd. backhoe, Cat D315, 22 in. shoes, item B-702, as is $8,750
1—Lorain TL-25, ¾ yd. backhoe, GMC 3-71, 22 in. shoes, item B-741, as is $8,750

BROWNING-FERRIS MACHINERY CO.
305 Exposition Ave. **2619 Texas Ave.**
Dallas, Texas **Houston, Texas**
TA 3-8121 **CA 5-3231**
Greggton and Lubbock, Texas

QUALITY USED EQUIPMENT

Int. TD-24 Cat. No. 25 cable unit and dozer. Excellent operating condition. $6,950. F.o.b. St. Joseph, Mo.
AC HD-6 Hi loader. Very low hours, like new throughout. $9,950. F.o.b. St. Joseph, Mo.
INT. TD-18 Bucyrus-Erie cable unit and dozer. Reconditioned. Newly rebuilt rollers. $4,950. F.o.b. St. Joseph, Mo.
INT. TD-14 Bucyrus-Erie hydraulic dozer. Reconditioned. Excellent general condition. $3,250. F.o.b. Chillicothe, Mo.
Crossville tree cutter for D-8 or TD-24. Excellent. $2,250. F.o.b. Chillicothe, Mo.
La Crosse lowboy tandem. Good tires. $2,950. F.o.b. Chillicothe, Mo.

SPECIAL

Link-Belt LS-85 ¾ yd. shovel. Cat. D-318 power. Reconditioned and painted. Only $7,950. F.o.b. St. Joseph, Mo.
Link-Belt LS-50 crane, 40′ boom. Reconditioned and painted. $3,950. F.o.b. St. Joseph, Mo.
Boom for 15-B dragline, 30′ section complete with upper point sheaves. $380. F.o.b. Chillicothe, Mo.

Phone **Wire** **Write**
MIDLAND MACHINERY COMPANY
Chillicothe, Mo. **St. Joseph, Mo.**
Phone: 280 **Phone: ADams 3-2516**

3—29-T Bucyrus-Erie Wire Line Blast Hole Drills.
2—42-T Bucyrus-Erie Wire Line Blast Hole Drills.
1—New RCA Metal Detector—10"x36" Aperture.
1—Fuller-Kinyon System.
1—Second-hand Drop Ball (3200#).
9—New Well Drill Bits—3¼"x4¼"—7 API Joints.
2—Pennsylvania, Class DE-2, two stage, duplex, cross compound, (direct connected), Synchronous Motor Driven Air Compressors.
Low Pressure Air Cylinder Diameter ...20"
High Pressure Air Cylinder Diameter ...12"
Stroke ..... 14"
1—4'x6' Kennedy Van Saun Double Deck Vibrating Screen.

NEW YORK TRAP ROCK CORP.
Old Mill Road, West Nyack, New York
Phone: NYack 7-4500

29-T churn drill parts available in Los Angeles. Contact: Kaiser Steel Corp., Equipment Dept., 612 S. Flower St., Los Angeles 17, Calif.

Backhoe attachment for 22-B Bucyrus-Erie, two years old, good condition $1,700
Adams 550 motor grader, fair condition .. $2,000

SOUTHEASTERN CONTRACTING CO.
P.O. Box 9068 **Birmingham, Ala.**

ONE—2¼-YD. COAL LOADING DIPPER, NEW FOR 38-B. LOCATED NEAR PITTSBURGH. $2500.
BOX 3720

MISCELLANEOUS EQUIPMENT

Model 42-T, International diesel powered, crawler mounted, complete with drilling and fishing tools for 9" holes. Good condition. Priced: $5000.
ALBERT MECKES
Gilbert, Pa. (near Stroudsburg, Pa.)
Phone: OVerbrook 1-2663

New late type backhoe for 22-B $2,750
TL-20 Lorain shovel front, new .....$ 650
22-B shovel front, complete, good $2,250
VALLEY EQUIPMENT COMPANY
2611 35th Ave., N.E. Salem, Oregon
Phone: EM 3-7432

When writing advertisers, please say you saw it in EXCAVATING ENGINEER

Thank you

"FASTER FROM FOSTER"
BEAT IT!
STEEL SHEET PILING
All sections from our regular stocks
L. B. FOSTER CO.
PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

Notes from the Manufacturers

American Hoist & Derrick Co., St. Paul, Minn., has named Patrick Bradley manager of distributor sales. Bradley joined American Hoist in 1951 as a district representative assisting with distributor sales and holding sales training schools throughout the United States and Canada. He will be responsible for distributor sales of hoists and derricks and the American line of truck and crawler crane-excavators.

Blaw-Knox Co., Pittsburgh, Pa., has named Austin K. Thomas general manager of its construction equipment division. Thomas will be in charge of sales, market planning and advanced engineering of the firm's line of construction and road building equipment. His entire business career has been in the field of construction and related equipment. This includes nine years' prior experience, 1926-35, with Blaw-Knox, as service and sales engineer of construction equipment.

Bucyrus-Erie Co., South Milwaukee, Wis., has appointed Charles Parthum as sales promotion manager. Parthum formerly was with the Harnischfeger Corp., Milwaukee, where for the last two years he had been director of public relations, sales promotion and advertising. Parthum has served with McManus, John & Adams, Detroit and New York advertising agency, as account executive for the Dow Chemical Co. account. He has also been with the Buchen Co., Chicago, where he handled advertising and sales promotion for a number of nationally-known companies.

Bucyrus-Erie Co. of Canada, Ltd., Guelph, Ont., has announced appointment of Russell E. Story as manager. The firm is a subsidiary of Bucyrus-Erie Co., South Milwaukee, Wis. Story was assistant to the manufacturing manager at Bucyrus-Erie's South Milwaukee works. The Canadian firm has been operating since the spring of 1957. It is producing two Bucyrus-Erie excavator models for the Canadian market—the ¾-yd. 22-B and the 1-yd. 30-B. Other models are expected to be added to the line later.

Euclid Div., General Motors Corp., Cleveland, Ohio, has appointed Olin A. Lee district representative in its central sales region. Lee will make his headquarters in Denver, Colo., and will work with Euclid dealers in Colorado, New Mexico, Arizona and sections of Nebraska, Wyoming and Texas. Prior to joining Euclid in 1954, he was manager of logging operations for Kosmos Div., U. S. Plywood Corp.

John A. Roebling Sons Corp., Wire Rope and Aircord Div., Trenton, N. J., has appointed Earl A. Frazier as sales manager for its Seattle (Wash.) district office. Frazier has been associated with Roebling since 1938. Prior to his present assignment, Frazier was in charge of wire rope sales in the New York and New England areas. His new territory includes Oregon, Washington, Idaho and most of Montana. John P. Kadlic will replace Frazier as New York district sales manager.

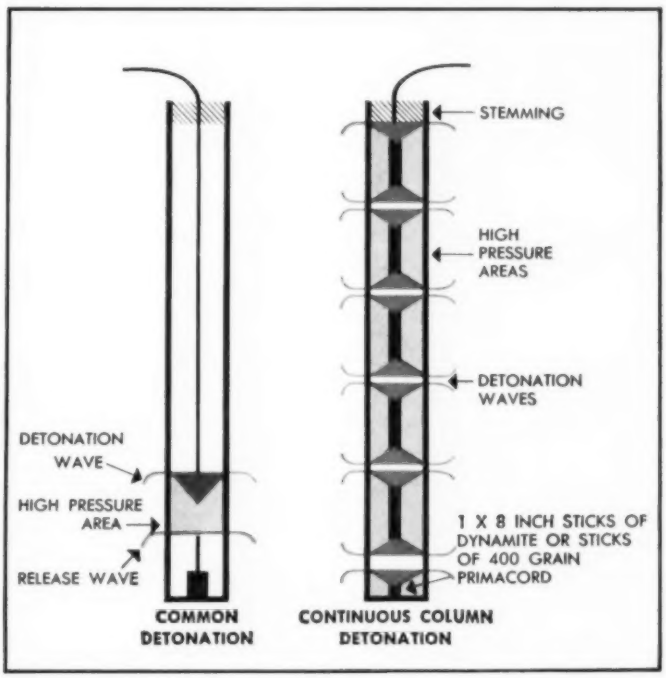
Koehring Co., Milwaukee, Wis., has appointed George M. Philpott Co., Inc., 1060 Bryant St., San Francisco, Calif., as a distributor. Equipment to be handled will include the full line of excavators from the ½-yd. model 205 to the 3-yd. model 1205; truck and "cruiser" cranes; 16-E and 34-E pavers; longitudinal finishers; "Mud-Jacks" for roadbed stabilization; and the Koehring Dumptor, an-off-the-road hauling unit. Territory assigned to the Philpott firm includes 29 California counties.

Phoenix Products Co., Milwaukee, Wis., has appointed Arnold Hildebrandt as product sales manager for its metal spinning division. Hildebrandt will direct sales of "Sturdilite" heavy-duty floodlights and "DryRod" electrode ovens. He has had 17 years experience in the metal spinning field. Sturdilite floodlights are used as standard equipment on many leading makes of power shovels, tractors and other construction equipment. The DryRod oven is used extensively in welding shops; it provides protection against moisture pickup in welding electrodes and is offered in both a portable and stationary size.

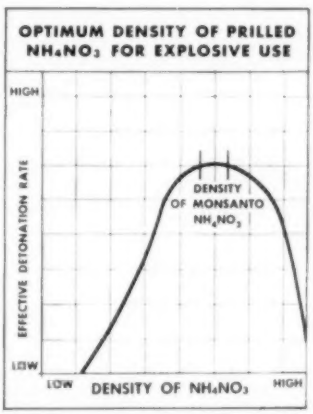
Explosives News from Monsanto Research

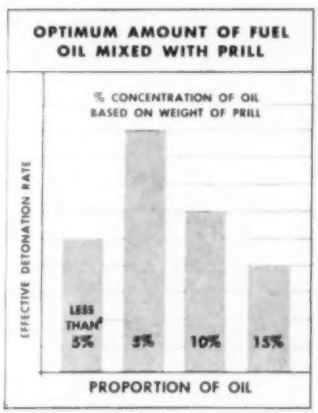
PRILLED AMMONIUM NITRATE IN CONTINUOUS COLUMN DETONATION GIVES BETTER BREAKAGE, SAVES DRILLING AND CRUSHING COSTS!

Continuous column detonation (right) gives better shatter because entire hole detonates approximately at speed of Primacord* (20,000 to 21,000 ft/sec.). Notice no release wave structure . . . entire hole works. Faster detonation cuts heat loss. Contained heat results in gas expansion—produces more work for less money. For the most favorable results, make sure hole is filled with NH_4NO_3 but don't risk destroying the best prill-pack by tamping. Pour oil in bag of Ammonium Nitrate. Let set for at least ½ hour before loading, or use mechanical mixer. Monsanto Ammonium Nitrate gives you optimum density of prilled NH_4NO_3 for explosive use *and* optimum prill size.



Ideal rock breakage, like this, reduces crushing costs. The Monsanto method of detonation, in conjunction with a new, top-quality prilled NH_4NO_3 that Monsanto research developed, will yield the equivalent of 60 % gelatin dynamite at ¼ the cost.





Monsanto Ammonium Nitrate is produced according to the specifications determined by Monsanto research. Results: more effective blast at greater savings plus optimum safety, speed and ease of handling. Monsanto is the world's largest producer of prilled ammonium nitrate—and a leader in developing NH_4NO_3 as an explosive for open work. Monsanto's experienced staff offers you complete technical service. Request report on latest research findings. Just write, wire or phone Monsanto.

CALL ST. LOUIS, WYdown 3-1000, COLLECT—OR WIRE NOW FOR COMPLETE INFORMATION

*Reg. U. S. T. M., Ensign Bickford

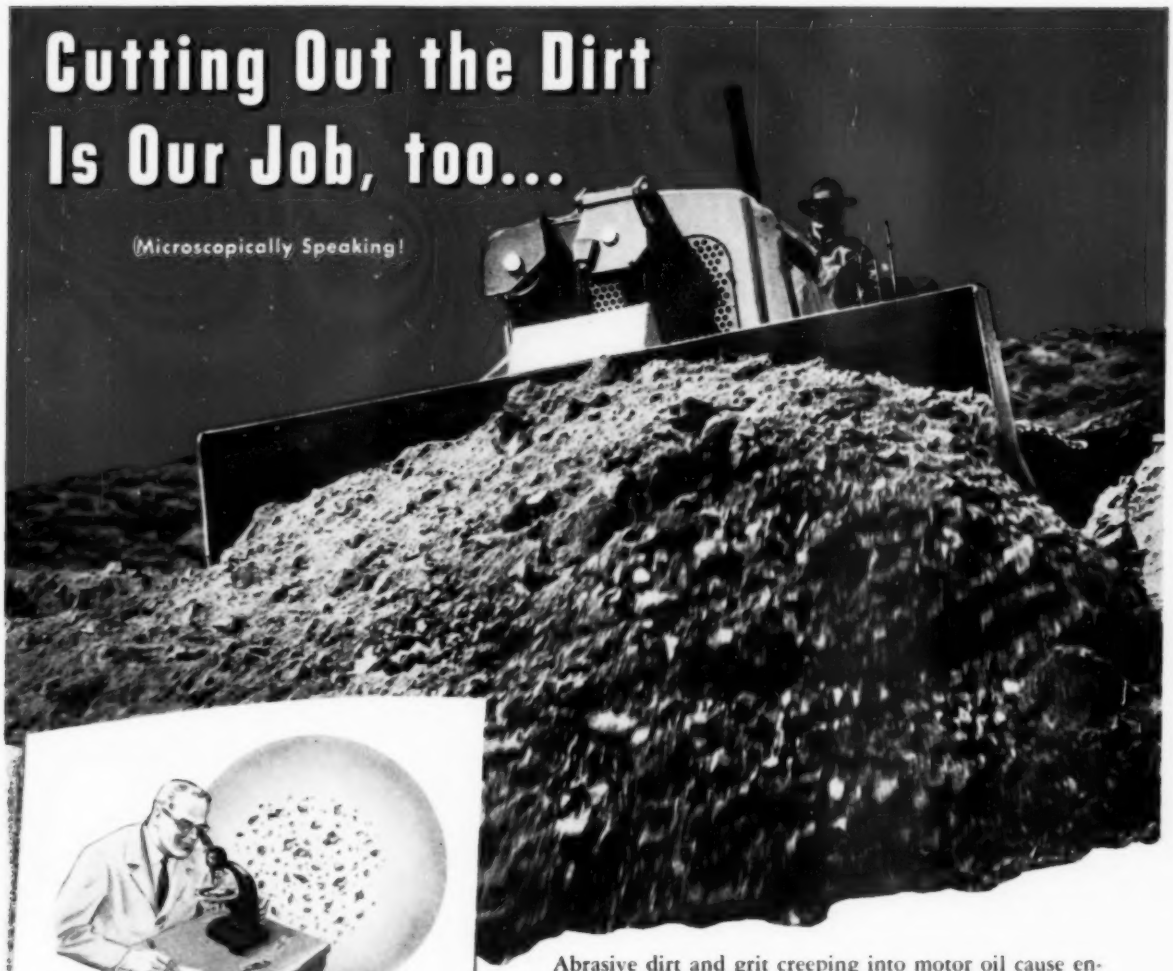
MONSANTO CHEMICAL COMPANY
Inorganic Chemicals Division
Dept. D-2
St. Louis 24
Missouri

Monsanto®

WHERE CREATIVE CHEMISTRY WORKS WONDERS FOR YOU

Cutting Out the Dirt Is Our Job, too...

(Microscopically Speaking!



℞ *Prescription Filtration*

There's a specific WIX Cartridge engineered for every engine in construction service . . . gasoline or Diesel—mobile or stationary—for lube, air and fuel.

CATERPILLAR
INTERNATIONAL
ALLIS CHALMERS
DETROIT DIESEL
LE TOURNEAU
MURPHY

and ALL OTHER Construction Equipment!

Abrasive dirt and grit creeping into motor oil cause engine failures that sideline construction equipment. But, WIX Lube, Air and Fuel Filter Cartridges keep your engines *clean* all the time!—don't give these contaminants a chance to get in their dirty work. Follow the practice of thousands of WIX-wise contractors and install WIX Hevi-Duty Cartridges in ALL *your* filters. It pays off in better, trouble-free lubrication and helps keep your equipment on-the-job.

WIX will make a FREE Filter Survey for you, listing all your engines and showing the correct lube and fuel filter Cartridge replacements you require. Also, deliver a reserve supply of these Cartridges to your local WIX Wholesaler—one near-by source of supply for prompt, COMPLETE Oil Filter Service at *your* job-sites—no heavy inventory for you. Ask your Jobber, or write us direct—TODAY!

wix® FILTERS

as seen in... The Saturday Evening POST

WIX CORPORATION • GASTONIA, N. C.
In Canada: Wix Corporation Ltd., Toronto